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18

19

20

21









TWELFTH ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

AND

VITAL STATISTICS


OF THE

COMMONWEALTH OF PENNSYLVANIA.

VOL. II.

*Transmitted to the Governor, December 1, 1896.*

CLARENCE M. BUSCH,  
STATE PRINTER OF PENNSYLVANIA.  
1897.



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# TABLE OF CONTENTS

OF

## VOLUME II.

	Page.
Appendix G. Conferences and Conventions—	
Invitation to World's Congress of Climatology, .....	552
Proceedings of the Associated Health Authorities of Pennsylvania, ..	552
Second annual meeting—	
Sanitary treatment of communicable diseases, .....	559
Compulsory vaccination, .....	566
Best means of educating the public in hygiene, .....	570
Exposed water supplies and typhoid, .....	576
Hospitals for contagious diseases, .....	586
Proper use of disinfectants, .....	588
Third annual meeting, .....	592
Bacteriological study of diphtheria, .....	603
Advantages of bacteriological investigations, .....	615
Efficiency of antitoxin, .....	622
Production, sale, etc., of milk, .....	627
Proceedings of the Ninth State Sanitary Convention, .....	633
Papers—	
Control of tuberculosis, .....	639
Diseases of domestic animals and man, .....	646
Diagnosis of diphtheria by cultures, .....	649
Hygiene of old age, .....	651
How diseases are contracted at school, .....	658
Diphtheria serum, .....	661
Flood conditions on the west branch, .....	667
Obstructions in the Susquehanna, .....	678
Relations of forests to public health, etc., .....	687
Causes of insanity, .....	696
Sanitary management of contagious diseases in children, .....	699
Sanitary problems in flooded valleys, .....	703
How to secure a pure milk supply, .....	709
Pennsylvania State Medical Society, action on vivisection, .....	717

A-19-76

## APPENDIX G—Continued.

Tenth Annual meeting of the National Conference of State Boards of Health, .....	718
Resolution on teaching hygiene in colleges, .....	719
National legislation, .....	720
Hospitals for consumptives, .....	720
Pollution of water, .....	721
National health authority demanded, .....	721
Vaccination propagation, committee on, .....	720
Rauch, John H., resolutions on, .....	722
Prevention of consumption, .....	722
Governmental dealing with tuberculous cattle, .....	723
Necessity for legislation giving State Boards power, .....	733
Medical colleges and teaching of hygiene, .....	737
Hygiene in medical education, .....	740
State and supervision over vaccine propagation, .....	742
Eleventh annual conference of State Boards, .....	751
Vaccine inspections, .....	753
Progress of State Boards, .....	766
Uniformity of laws for dead transportation, .....	797
Immigrants and small-pox, .....	797
Vital statistics, how to obtain, .....	797
How to obtain potable waters for cities, .....	798
National Department of Health, .....	798
State supervision of antitoxines, .....	800
State and milk products, .....	800
State boards of local bodies, .....	800
Twenty-fourth annual meeting of the American Public Health Association, .....	801
Pure milk, .....	803
Animal diseases and food, .....	803
Typhus fever, .....	804
Nomenclature, .....	804
Need of uniformity on the meaning of "still born," .....	804
Dergue, .....	804
Municipal responsibility for healthy school houses, .....	804
Annual address, .....	804
Quick or the dead, .....	805
Transportation of the dead, .....	806
Garbage disposal, .....	806
Blindness prevention, .....	807
National health legislation, .....	807
Study of yellow fever, .....	808
Pollution of water supplies, .....	808
Inoculation in infectious diseases, .....	808
Serum test for typhoid fever, .....	808
Prophylaxis of typhoid, .....	808
Formaldehyde, .....	808
Paludism, .....	808
Public hygiene, .....	808
Diphtheria, .....	809
Bicycle, .....	810
Alcoholic drinks and health, .....	808
Public baths, .....	810

	Page.
<b>APPENDIX G—Continued.</b>	
Forestry and public health, .....	810
Vaccination; drunkenness and vice; cattle and man inspection; scurvy in prisons; noises and health; degeneration of the human animal; etc., .....	810
<b>Appendix H. Correspondence and Legal Opinions.</b>	
1. Legal opinions—	
Opinions in the salt water pollution case at Butler, Justice Williams, .....	813
Opinions of the Supreme Court in the case of Brymer, et al. vs. Water Company, .....	818
Decision of His Honor Judge Morrison on the compulsory vaccination law, .....	822
Decision of the Supreme Court on the duty of health boards to appraise and pay for effects destroyed by their orders, .....	825
Opinion of His Honor M. Russel Thayer on the legal scope and significance of "Public Streams," .....	826
Argument of E. R. Mayo, Esq., on what is a municipality, .....	827
Opinion of J. Davis Brodhead, Esq., on course to abate a nuisance caused by a cess pool on private property, .....	830
2. Correspondence—	
Notice of the establishment of a Provincial Board of Health at Victoria, B. C., .....	831
Regulations of public schools, .....	832
<b>Appendix I—</b>	
Organization, by-laws and regulations of the State Board of Health and Vital Statistics, .....	832
Officers and members, .....	832
Inspectors, .....	833
Constitution, .....	835
By-laws, .....	839
Regulations of the Board, .....	843
<b>Appendix K. Circulars and forms—</b>	
1. Form of information as to laws passed by the Legislature, .....	863
2. Form of tabular abstract for local boards, .....	865
3. Form of register of undertakers, .....	866
4. Form of register of midwives and professional nurses, .....	867
5. Form of register of plumbers, .....	868
6. Form of register of vaccination, .....	870
7. Form of physician's certificate of disinfection, .....	871
8. Form of physician's certificate of vaccination, .....	871
9. Form of physician's certificate to school teachers of safety to return from infected premises, .....	872
10. Health officers notification to prevent blindness, .....	872
11. For bacteriological diagnosis, .....	873
12. Reply for request for analysis of water, .....	878
13. Instructions for taking samples of water, .....	878
14. For permission to remove dead body, .....	879
15. For information reference to the effect on the water supplies of discharge of tanneries, .....	879
16. Monthly reports of boards of health, .....	881
17. Urging the formation of associated boards of health in counties, .....	882



	Page.
Appendix L—	
List of local boards of health. ....	883
Appendix M—	
Additions to library, ....	896
Appendix N—	
Ninth Annual Report of the State Pharmaceutical Examining Board. ....	901
Appendix O—	
Report of the State Medical Council, ....	1009
Appendix P—	
Meteorological observations, ....	1021

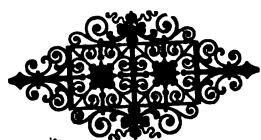
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## PART II.

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APPENDICES G, H, I, K, L, M, N, O AND P.

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## APPENDIX G.

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### CONFERENCES AND CONVENTIONS.

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1. Invitation to the World's Congress of Climatology.
2. Second Annual Meeting of the Associated Health Authorities of Pennsylvania.
  - The Sanitary Treatment of Communicable Diseases, by Charles McIntire, M. D.
  - Compulsory Vaccination, by Moses Veale, Esq.
  - The Best Means of Educating the General Public in Matters of Practical Hygiene, by Moritz G. Lippert, C. E.
  - Exposed Water Supplies and Typhoid Mortality in American Cities, by E. G. Matson, M. D.
  - Hospitals for Contagious Diseases for Cities and Towns of Moderate size, by J. C. Hutton, M. D.
  - The Proper Use of Disinfectants, by Benjamin Lee, M. D.
- Third Annual Meeting of the Associated Health Authorities of Pennsylvania.
  - The Bacteriological Study of the Etiology and Diagnosis of Diphtheria, by R. L. Pittfield, M. D.
  - Advantages of Bacteriological Investigations to Boards of Health, by B. Meade Bolton, M. D.
  - The Efficiency of Antitoxin as a Remedial Agent in Diphtheria, by Joseph McFarland, M. D.
  - The Production, Transport, Sale and Delivery of Dairy Products Should be Under the Sanitary Control of the Local Board of Health Where These Products are Consumed, by Edward O. Shakespeare, M. D.
3. Proceedings and papers of the Ninth State Sanitary Convention, held at Williamsport, May 21, 22, 1896.
  - The Control of Tuberculosis, by L. F. Flick, M. D.
  - Diseases of Domestic Animals Communicable to Man, by L. Pearson, B. S., V. M. D.
  - The Diagnosis of Diphtheria by Means of Cultures (Synopsis from the First Annual Report of the Bacteriological Division), by B. M. Bolton, M. D., and H. D. Pease, M. D.
  - The Hygiene of Old Age, by J. Y. Dale, M. D.
  - The Diphtheria Serum, by Joseph McFarland, M. D.
  - Flood Conditions on the West Branch of the Susquehanna, by Geo. D. Snyder, C. E.
  - The Obstructions in the Susquehanna River at Williamsport and the Necessity for Their Removal, by John Fulton, C. E.
  - Relations of Forests to Public Health and Prosperity, by John T. Rothrock, M. D.
  - Causes of Insanity, by W. E. Wright, M. D.
  - Suggestions about the Sanitary Management of Contagious Diseases in Children, by Pemberton Dudley, M. D.
  - How to Secure a Pure, Healthful Milk, by Aug. Richter, M. D.
4. The Medical Society of the State of Pennsylvania—Action on Vivisection.

5. Report of Benjamin Lee, M. D., as delegate to the Tenth Annual Conference of State Boards of Health.

Is it Possible to Have United Action Throughout This Country in the Restriction and Prevention of Consumption?, by C. O. Probst, M. D.

What is the Best Method of Governmental Dealing with Tuberculosis in Cattle? by F. O. Donohue, M. D.

The Necessity for Legislation to Give the State Board of Health in Each State Power to Enforce Its Orders and Recommendations Relating to Public Health, by G. F. Ingersoll, Esq.

Should Medical Colleges be Required to Devote an Adequate Time to Instruction in Hygiene and Exact of Candidates for the Degree of Doctor of Medicine an Examination in This Branch of Medical Education, by R. H. Lewis, M. D.

Shall the State Maintain Supervision of the Propagation of Vaccine Virus, by J. W. Scott, M. D.

Proceedings of the Eleventh Annual Conference of State Boards of Health:

Report of the Committee on Vaccine Farms, by Gardner T. Swarts, M. D.

What Substantial Progress is Being Made in Sanitary Work in the Several States and Provinces.

Is It Not Possible to Have Uniformity of Laws and Rules for the Transportation of Corpses?

Does Not Sanitary Science Provide Sufficient Knowledge and Skill to Transport a Corpse Dead of Any Disease in Such a Manner as to Be Safe to the Public?

What Shall Be Done With Immigrants Who Arrive on Vessels Infected With Smallpox? by W. J. Scott, M. D.

How to Obtain the Vital Statistics of a State, by H. B. Baker, M. D.

How May Cities Obtain Potable Water When Compelled to Depend Upon Rivers Polluted by Sewage for Their Supply? by G. T. Swarts, M. D.

Address by Hon. B. A. Eckart descriptive of the Enterprise of Diverting the Sewage of Chicago Into the Mississippi River.

A National Department of Public Health, by Jerome Cochran, M. D.

Should the State and Provincial Boards of Health Have Supervision and Be Responsible for the Quality of Antitoxines Manufactured or Used Within Their Respective State or Provinces? by C. A. Lindsley, M. D.

Is It Necessary to Use Isolation, Placarding or Other Quarantine Restrictions in the Prevention of Typhoid Fever?

Papers read by title.

6. Report of Benjamin Lee, M. D., as delegate to the Twenty-fourth Annual Meeting of the American Public Health Association.

Car Sanitation.

Cleaning of Passenger Railroad Cars.

Contagion of Venereal Diseases in Railroad Cars.

Composition and Infectiousness of Milk.

Pure Milk.

Animal Diseases and Animal Food.

Contribution to the Study of the Pathogeny, Etiology and Prophylaxis of Typhus Fever.

Nomenclature of Diseases and Forms of Statistics.

Need of Uniformity in the Meaning of the Term "Stillborn."

Dengue, or Breakbone Fever.

Municipal Responsibility for Healthy School Houses.

Growth of Public Hygiene in Mexico.

The Quick or the Dead.

Transportation and Disposal of the Dead.

Cremation.

A Plea for the Domestic Disposal of Garbage.

Measures for the Prevention of Blindness.

Miasmatic Fevers in the State of Sonora.  
Sanitary Legislation in the State of Mexico.  
Obiter Dicta Concerning Sanitary Organization.  
National Health Legislation.  
Sanitary Administration of Unincorporated Districts.  
Prevention of the Spread of Yellow Fever.  
Pollution of Water Supplies.  
River Conservancy Board of Supervision.  
Protective Inoculations in Infectious Diseases.  
Typhoid Fever.  
Serum Diagnosis Test for Typhoid Fever.  
Prophylaxis of Typhoid Fever.  
Formaldehyde.  
Prophylaxis of Paludism.  
Public Hygiene in the State of Tamaulipas.  
Public Health in Tabasco.  
Sanitation in Hospitals for the Insane.  
Cause and Prevention of Diphtheria.  
Diphtheria in Chihuahua.  
Bacteriological Diagnosis as Governing the Admission and Discharge of  
Patients in Diphtheria Hospitals.  
Should Measles be Quarantined?  
Causes and Prevention of Infant Mortality.  
Mortality of Infants.  
Diarrhoea of Children.  
The Bicycle in Its Sanitary Aspect.  
Alcoholic Drinks from a Sanitary Standpoint.  
The Part That Public Instruction Should Have in the Way of Precaution  
Against Contagious Diseases.  
Public Bathing Establishments.  
Reports of Committees.  
Papers read by title.

## INVITATION TO THE WORLD'S CONGRESS OF MEDICO-CLIMATOLOGY.

---

Secretary and President State Board of Health:

Dear Sirs: I enclose herewith circular by which you will see that the World's Congress of Medico-Climatology will hold a national convention in this city February 20, 21 and 22, 1896, and you are most earnestly and cordially invited to attend, as this subject is one of importance to all who are interested in climatology and general sanitation.

It is highly important that every section of the United States be well represented and it seems most befitting that the active officers of the board of health of the leading states in the Union should be present and assist in classifying the various climates, and at the same time give the entire medical profession of the United States much needed information regarding their own section.

We respectfully suggest that each state should have enough pride to prompt it to send representatives to this congress, which is both national and international in its aspect, and is made up of the very cream of the profession throughout the whole country, so that the facts concerning their climatic and sanitary advantages should be made known to the congress and be disseminated throughout the world through our organization.

The medical press will give us the most hearty support, and all important papers and data will be preserved in the archives of the congress, and a full report of all proceedings will be published in our official organ, *The Journal of Diagnosis and Climatology*, and other leading medical journals.

Will you do us the courtesy to favor us with an early reply, informing us whether you can be present, and will you not read a paper, and if so please give us the subject; also kindly notify us whether you will be accompanied by any members of your family.

You are hereby authorized to delegate from one to three physicians to represent your State, in addition to yourselves if desired, and if so appointed, we would like to know their names and addresses, so that we may extend to them a formal invitation.

Awaiting your early reply. I am,

Very respectfully,

W. S. ROWLEY,  
Corresponding Secretary.

PROCEEDINGS OF THE ASSOCIATED HEALTH AUTHORITIES  
OF PENNSYLVANIA.

---

· Second Annual Meeting.

---

The Associated Health Authorities of Pennsylvania met in the Supreme Court room, Harrisburg, January 30, 1895.

First Vice President, Major Veale, of Philadelphia, introduced Governor D. H. Hastings, President ex-officio, who called the meeting to order.

Prayer was offered by Rev. I. W. Bagley.

Dr. Benjamin Lee, chairman of the Executive Committee, addressed the Governor as follows:

"Your Excellency, Mr. President: While on the one hand I congratulate this convention on the honor of having in its chair the Governor of the State, and one who has been called to that high office by a majority so stupendous as to be altogether unexampled, on the other I hold that not among the least of the honors which have so deservedly come to you, in consequence of the crowning honor of election to the chief magistracy of this immense Commonwealth—imperial in its domain, inexhaustible in its resources, and noble in its history—I say, not among the least of the subsidiary honors which have thus accrued to you is that of being, ex officio, the President of the State Associated Health Authorities of Pennsylvania, and the presiding officer of the State Sanitary Convention. Preventive or state medicine, though an infant in years—so young that even now its very name is strange to many ears—has already become a giant in strength. All deep thinkers in the medical profession recognize it as the medicine of the future. The possibilities which open before it in the prevention of human suffering and the prolongation of life cannot be estimated. One after another the awful plagues which devastated the earth in the days of our ancestors are being shorn of their terrors. That loathesome pest, small-pox, which formerly swept off one-sixth of the human race, has, within one hundred years, been so brought under control by vaccination, that it can almost be disregarded as a factor in mortality tables. Not a year now passes but some great discovery holds out to us new promise for the welfare of humanity. The past year, with its suggestions of immunity by serum inoculation, has been



especially fruitful. Experiments in this field are now being conducted by health authorities all over the United States. To the shame of Pennsylvania, be it said, her own State Board of Health has done comparatively nothing in this important field, owing to lack of pecuniary means. May we not hope, Mr. President, that your influence as the Chief Executive of the State, will be used to induce the legislature to exercise more enlightened liberality in this respect. I had occasion, sir, a year ago, to remind the then occupant of the gubernatorial chair that he had been, so to speak, the accoucheur of the Board, had presided at its birth and launched it into the world by the stroke of his official pen. You, however, were the friend and comrade of its early years. Scarce had the fateful waters, which, sweeping with cataclysmal force down the picturesque valley of the Conemaugh, in one brief moment converted a populous city into one vast ruined charnel house, begun to subside, when you were on the spot to rescue, to succor and to protect. And there, week after week, through fire and flood, through mud and mire, through heat and tempest, in hunger and thirst, in watchings often, you stood shoulder to shoulder with the Board, aiding it, both by your counsel and your authority, in its every effort to protect the lives and health of the wretched survivors who clung to the hillsides, and to prevent pestilence as the result of the disaster. You know, if any man, whether the Board was faithful to its trust in that hour of calamity. I think I am justified in saying that the lofty courage, the steadfastness of purpose, the executive ability and the large-hearted generosity which you displayed at that time revealed you to the people of the State as their future ruler. A bond was thus established between yourself and the Board which we, for our part, trust may be perpetual. As an earnest of this wish I am instructed by the Board to present to you as the president of the State Associated Health Authorities, this gavel. Made of the most imperishable of woods, may it be an emblem of the enduring character of our mutual esteem and regard."

The Governor accepted the gavel, saying:

"Gentlemen: It gives me great pleasure to meet you here this morning, and so far as I am able I shall be glad to unite with you in your deliberations. I want to assure each and all of you of my entire and cordial sympathy with the subject matter of the two organizations that are met here to-day, and to assure you of my desire to co-operate with you in every way to carry out to the best interest of the State the deliberations that you have in hand. I am not sure that I can sit with you very long to-day. My time is pretty well occupied, but I assure that it will be a great pleasure as well as an honor for me to sit with you here awhile. (Applause.)

"I suppose you will not be very much surprised if I tell you that I hardly know what kind of a reply to make to this most eulogistic speech of my good friend, Dr. Lee, accompanied with the presentation of this gavel. These are some of the things that take even the most experienced speakers off their feet.

"I call to mind now my first acquaintance with your secretary, Dr. Lee. He has referred to the unfortunate accident that brought us both together in the valley of the Conemaugh. I remember with so much gratitude and so much pleasure, if it is mingled with a good deal of sadness, the kind, warm and personal relations with Dr. Lee while we were doing the best we could for that unfortunate valley. It was there that I had forced upon my attention, more than ever before in my life, the value of these associations that are represented in this convention here to-day. I had occasion to meet a number of the officials who were then connected in this good work, and the impression made upon me from the very careful observation, which led me to see that everything that was done, satisfied me that this branch, this department of our state government, was and is now, I believe, in the hands of philanthropic, broad-minded, large-hearted humanitarian men, who are not only willing but anxious to do that which they can to relieve their unfortunate fellow citizens.

"I accept, Dr. Lee and gentlemen, I accept this gavel with my profound thanks, and I beg to extend to you all my grateful acknowledgment for this most kindly and sympathetic weapon which you have given me and, as I said a moment ago, I desire to assist and to hold up your hands, and to help you wherever possible in the great work which you have undertaken. If there is nothing further of a miscellaneous character, I will proceed with the first item on the program which you have prepared."

The first paper in order was by Dr. Charles McIntire, Easton, and in his absence was read by the Secretary: "On the Sanitary Treatment of Communicable Diseases."

Mr. Crosby Gray read a paper on the Legislative Restriction of Communicable Diseases.

Major Veale read a paper on "Compulsory Vaccination" (Dr. Lee presiding).

On motion of Dr. Lee, Dr. J. T. Rothrock, of the Forestry Commission, was invited to a seat with the association.

Dr. Rothrock, in replying to this courtesy, alluded most forcibly to the vast importance of preserving the forests.

On motion of Dr. Pemberton Dudley, it was

Resolved, That the Associated Health Authorities of Pennsylvania hereby endorse the bill, now before the Legislature, for establishing

three forestry reservations at the head waters of the principal watersheds of the State, believing that the action contemplated will be of much importance for the protection of the purity of the streams indicated.

Resolved, That a copy of this resolution be sent to each member of the legislature.

An executive session was held in the afternoon.

Mr. Crosby Gray made some remarks upon compulsory vaccination.

Dr. Lee presented the report of the executive committee.

On motion of Mr. Lippert it was received and filed.

Mr. Lippert presented the report of the publication committee.

On motion it was received and filed, and the appended resolution unanimously adopted.

By permission, Major Veale presented the "Necessity for Hospitals for the Treatment of Tuberculosis.

On motion of Mr. Lippert, a committee of three was appointed to prepare resolutions bearing upon the subject.

Committee.—Mr. Crosby Gray, Dr. J. G. Shoemaker and Dr. J. C. Green.

On motion of Dr. W. B. Atkinson, the election of officers for the ensuing year was made the first business of Thursday morning.

Questions being asked relative to disinfectants in diphtheria, by suggestion of the president, Dr. Atkinson spoke upon the use of chlorine, etc. Major Veale introduced the subject of the adulteration of milk, and on motion of Mr. Crosby, the bill to amend the act on adulteration of milk so that it may apply to all cities and towns in the State in place of those of the second and third class was referred to the committee on legislation.

Mr. Gray read the act prepared by the committee for the better protection of health, etc.

Mr. Gray having offered an amendment to the laws of the association to strike out the word "State" in the title, on motion it was laid over to be considered under unfinished business on Thursday.

Mr. M. G. Lippert offered the following amendment to the laws:

"Associate Members.—Associate members may be those formerly connected with boards or bureaus of health, whether represented or not in this association, or those now connected with such not represented in this association. The annual dues shall be one dollar, and they shall be entitled to participate in the discussions at the meetings of the association and to receive copies of the printed proceedings and of all other publications of this association, but they shall not be entitled to vote."

This was unanimously adopted.

Thursday, January 31, 1895.

Major Veale in the chair.

The election of officers for 1895 being in order, nominations were opened.

First vice president, Major Moses Veale.

Second vice president, Crosby Gray.

Third vice president, Dr. W. E. Allen.

Treasurer, Dr. Jesse C. Green.

Secretary, Dr. Wm. B. Atkinson.

On motion of Dr. P. Dudley, Mr. Lippert cast the unanimous vote of the association for these gentlemen, and they were declared elected for the ensuing year.

On motion of Mr. Lippert, His Excellency ex-Governor Robert E. Pattison was unanimously elected an honorary member.

The report of the legislative committee having been called for, Mr. J. A. McLaughlin, in the absence of the chairman, Mr. E. S. Wagner, announced that no report or papers had been forwarded. He moved that the association endorse all the bills that had been recommended and requested their passage.

Dr. G. G. Groff moved that a committee be appointed to wait on the Committee on Sanitation of the Senate and House recommending and requesting the passage of these bills.

On motion of Mr. J. A. McLaughlin, the association emphatically disapproved of the repeal of the law creating borough boards of health.

A bill offered asking for the registration of plumbers was referred to the legislative committee.

On motion of Mr. J. H. Harlow, the secretary was requested to notify all the boards of health in reference to the bill repealing the act and ask them to communicate with the committee of the House.

Dr. Lee, having detailed the points of the bill providing for township boards of health, on motion of Mr. McLaughlin, the bill was endorsed and its passage recommended by the legislature.

Dr. Groff offered a resolution urging the passage of a bill to offer a prize of \$25,000 to the discoverer of the best method for the disposal of sewage by precipitation, filtration or otherwise in a solid mass so that it may be returned as fertilizer to the land.

A rising vote being necessary to decide, it was carried twenty-one to fifteen. The question being asked as to the fifth member of a local board, required by the law to be a physician, what was to be done when no physician was willing to act; it was referred to the legislative committee.

On motion of Mr. Gray, the association endorsed the appeal of Major Veale for legislative action on tuberculosis.

Dr. Lee read the titles of certain bills the passage of which had been urged by the State Board of Health and each was respectively endorsed by the association.

On motion of Dr. Shoemaker it was resolved that

Whereas, Since some of the contagious diseases of animals are transferrable to man and it is important from the standpoint of public health that they should be suppressed by competent state authority as thoroughly as possible, be it

Resolved, That this association favors properly directed scientific and practical efforts in this direction, and the enactment of a law that will permit of this.

On motion of Dr. Lee, Dr. Leonard Pearson, president of the State Veterinary Association was invited to the privileges of this association.

The treasurer presented his annual report, showing a balance of \$51.57; it was received and referred for audit to the executive committee.

Dr. Jesse C. Green, as treasurer of the State Associated Health Authorities of Pennsylvania, submits the following report ending January 30, 1895:

To cash received from 56 boards of health, .....	\$280 00
By cash paid for stationery, printing and postage, .....	228 43
	<hr/>
Balance, .....	\$51 57
	<hr/>

The undersigned, members of the executive committee acting as an auditing committee, respectfully report that they have carefully examined the annual report of the treasurer and compared it with the vouchers and find the same to be correct, and that there was a balance in the treasury, January 30, 1895, of \$51.57.

BENJAMIN LEE, Chairman.  
CROSBY GRAY.

The special committee on Dr. Groff's resolution was Dr. Groff, Mr. Gray and Dr. Shoemaker.

The president announced as the standing committees for 1895:

Executive.—Dr. B. Lee, Philadelphia; Crosby Gray, Pittsburg; Dr. A. H. Halberstadt, Pottsville; Dr. E. G. Matson, Pittsburg; E. S. Miller, Altoona; J. G. Shoemaker, Phoenixville; Dr. W. E. Allen, Scranton.

Publication.—M. G. Lippert, C. E. Phoenixville, Dr. W. H. Ford, Philadelphia; J. H. Harlow, C. E. Edgewood; and Drs. W. B. Atkinson and B. Lee, Philadelphia, ex-officio.

Legislative.—A. M. Beitler, Esq., Philadelphia; C. P. Weaver, Norristown; Dr. A. H. Strickler, Waynesboro; J. A. McLaughlin, Allegheny; Dr. A. Enfield, Bedford.

Dr. Hugh Hamilton, Harrisburg, read a paper on the "Relations of Topography to Sewerage."

M. G. Lippert read one on the "Best Means of Educating the General Public in Matters of Practical Hygiene."

Dr. Groff discussed this subject and offered the following:

Whereas, It has been affirmed that the instruction in hygiene and sanitary science in the public schools of this State is from books unreliable and without scientific standing; and

Whereas, These allegations have been denied; therefore, be it

Resolved, That the president of this association appoint a committee of three members to examine the books in use and the methods employed in teaching hygiene and sanitary science in this State, said committee to report at the next annual meeting of this association.

After discussion, it was unanimously adopted.

On motion of Dr. Lee, the committee was extended to five.

Committee. Dr. G. G. Groff, Dr. P. Dudley, H. Murphy, C. E., M. G. Lippert, C. E., and Dr. H. H. Whitcomb.

Dr. J. S. Carpenter, of Pottsville, read a paper on typhoid fever.

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Afternoon, 2.30.

Dr. E. G. Matson, Pittsburg, read a paper on "Exposed Water Supplies and Typhoid Mortality."

Dr. J. C. Hutton, Harrisburg, exhibited diagrams of hospitals for contagious diseases in cities and towns of moderate size.

Dr. B. Lee spoke on the Proper Use of Disinfectants.

Mr. Crosby Gray called up the amendment to the title of the association.

On his motion, the word "State" was unanimously stricken out.

Mr. Crosby Gray offered the following:

Resolved, That a special committee be appointed by the chair to consider the feasibility of preparing a uniform code of health laws that shall be applicable to the entire State, and if found feasible, to then prepare and report to this association such an act.

Committee.—Mr. Gray, M. Veale, A. M. Beitler.

On motion of Mr. Gray, the first vice president was made a member of the committee to codify the laws.

On motion, it was agreed that the secretary should send to each member of the Legislature an abstract of the proceedings concerning the desires of the association with regard to sanitary legislation.

At 8 p. m. the association met in the Legislative hall and heard an address by Prof. T. M. Drown, M. D., chemist of the Massachusetts State Board of Health.

Dr. B. Lee followed on the "Sanitary Legislation Needed in Pennsylvania."

Remarks were made by Dr. P. Dudley and others.

The association then adjourned sine die.

W. B. ATKINSON, Secretary.

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## THE SANITARY TREATMENT OF COMMUNICABLE DISEASE.

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By Charles McIntire, A. M., M. D., Easton, Pa.

(Lecturer on Sanitary Science, Lafayette College.)

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The dogmatic style is assumed in this paper not from any presumption of superior knowledge, but because an attempt to demonstrate the propositions stated would either make the paper insufferably long or restrict it to a very small portion of the theme. Should it cause any of you to dispute the accuracy of the statements and debate the question for yourselves, it may possibly be of greater benefit than if the demonstration were attempted.

A communicable disease is one that is able to be communicated from one person to another. The method of communication whether by direct contact, e. g., as in smallpox; or indirectly through food or drink, e. g., as in cholera; or in any other imaginable way, does not enter into the idea; any disease that can be communicated is a communicable disease. And the sanitary treatment of communicable disease comprises the means adopted to prevent the communication.<sup>1</sup>

While the disease is communicable if it can be communicated, independent of the method of communication, our methods to restrict this communication depend upon the hypothesis we adopt as to the way the disease is carried; and our success in preventing the spread of the disease depends on the correspondence of this hypothesis to the facts in each case. Thus cholera flourished, despite precautions, when it was thought to be carried from person to person; and now it can be checked when we act upon the hypothesis that it is a water-borne disease. As this is a brief paper to open a discussion, and not a treatise, our attention will be confined to the list of diseases ordinarily included in the ordinances as diseases to be reported to the

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<sup>1</sup> Thus, when Dr. Baker, the secretary of the Michigan State Board of Health, tabulates all the outbreaks of diphtheria in Michigan for one year, e. g., for 1890 (the last report published), and shows in the 71 outbreaks where no sanitary treatment at all was attempted, there were, in all, 902 cases and 169 deaths; while in 46 outbreaks where sanitary treatment was carefully carried out there were but 70 cases and 15 deaths, we can see there is such a thing as sanitary treatment.

health authorities.<sup>2</sup> These diseases are now, many of them, associated with the presence of pathogenic or toxigenic microbes; the hypothesis of some is that there is a specific organism for each. The communication is caused by the transference of the special bacteria, or a product produced by them—ptomaine or toxin—from the sick to the healthy; the method of conveyance differing with different diseases. This broadly states the hypothesis and, while there are many gaps in our knowledge, of the details, and of late a remonstrance rather of ridicule than of argument against it, it probably furnishes us the best working hypothesis with our present knowledge, many points being demonstrated and beyond the hypothetical stage. It behooves us who have to carry on the actual campaign in this "Krankenkrieg," either to prove the falsity of the hypothesis by the presentation of facts that cannot be harmonized with its statements or to accept it and intelligently make use of the knowledge it gives us.

Turning for a moment from this question of hypothesis to one of experience, it is well for us to keep constantly in mind that sickness of any kind causes additional expense and care in a household. When the disease happens to be a communicable one, the methods of the health officer add materially to the discomfort, care and expense; often causing an expenditure of the public money as well as the additional cost to the individual. For this reason, in our sanitary treatment of disease, we should impose no unnecessary burden, cause not a single needless penny to be expended.<sup>3</sup> We are so often dazzled by the glittering calculations made of the amounts saved by the community by sanitary supervision that there is a possible liability to be tempted to carelessness in this direction.

Keeping in mind the present hypothesis of the nature of communicable diseases; and the importance of considering the comfort and economizing the expenditure, permit me to suggest a few principles that should underlie the sanitary treatment of all communicable diseases.

I. We should live up to the knowledge we have and not impose hardships in the way of restrictions that our knowledge shows to be unnecessary. For example, the usual method of communication of typhoid fever is by infecting the alimentary canal through contaminated food or drink. Cases of personal contagion have been

<sup>2</sup> The Board of Health of the city of Easton includes under the "pestilential or contagious diseases:" Asiatic cholera, relapsing fever, yellow fever, typhus fever, cerebro-spinal meningitis, small pox and varioloid, scarlet fever, diphtheria and typhoid fever (Rules of the Board of Health of the city of Easton, adopted May 14, 1890, No. 23.) and this list corresponds very closely with most lists. Osler, "The Principles and Practice of Medicine," 1892, includes under specific infectious diseases: Typhoid fever, typhus fever, relapsing fever, small pox, vaccinia, varicella, scarlet fever, measles, rubella, mumps, whooping cough, influenza, dengue, cerebro spinal meningitis, diphtheria, erysipelas, septicaemia and prenia, cholera Asiatica, yellow fever, dysentery, malarial fever, anthrax, rabies, tetanus, syphilis, tuberculosis, leprosy, glanders, actinomycosis and several others which he marks as of doubtful nature. A comparison of the two lists would make an interesting study, with possibly a revision of the health authorities' list. One thing clearly shown in the list of the clinician is that, as we now see it, a disease produced by an infection is not necessarily communicable.



claimed, but it may be doubted if careful observation has shown that this communication was by transference through the air of some easily wafted and impalpable germ, after the fashion of small-pox, but rather as is claimed by Osler, by the person becoming soiled by the alvine discharges of the patient.<sup>1</sup> Why, then, should there be any necessity to include deaths from this disease among those in which special precaution must be taken for transportation upon the railways, unless, indeed, the road traverses a region inhabited by cannibals? In the same way cerebro-spinal meningitis does not seem to be any more apt to be communicated than pneumonia. Why should physicians be compelled to report the one to the health department and not the other?

II. We should be frank to acknowledge the limitations in our knowledge, and where the case under treatment involves problems still unsolved, our precautions should include an attempt to protect against every plausibly possible method of communication.

III. We should be constantly on the alert to learn new facts concerning any disease and to modify our method of treatment accordingly.

IV. The sanitary treatment of disease should only be attempted by those who have received the proper education. This is nearly synonymous with the assertion that the health officer should be a physician. A municipal corporation requiring some services involving a knowledge of the law, or of civil engineering, does not employ the chief of police or the high constable, and it is no reflection on the integrity or general intelligence of these officials that they are not so employed. Why should they be expected to have the special knowledge of a much more complicated subject than either? As to the matter of salary, one would think that any municipality would be willing to pay at least as much for its health officer as for its surveyor or attorney; if it is not so willing, it would be better for every self-respecting physician to decline a position on the board of health. Others will doubtless be found to take their places; that is their lookout, let them; in due time the community will see the difference.

Building on these foundation principles, I will endeavor to outline the course to be pursued in the sanitary treatment of any outbreak of communicable disease. As the details will vary with the nature of the disease, for the purposes of definiteness, I will, for the most part, illustrate the various procedures by a hypothetical outbreak of diphtheria.

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<sup>1</sup> Dr. P. Watron Williams, of Bristol, England, at the last meeting of the British Medical Association, read a paper on, "Typhoid Fever of a Peculiarly Virulent Type Communicated by the Breath." *British Medical Journal*, December, 1894. Beyond the probable discovery of the Eberth-Gaffky bacillus in an ulcer of the larynx of a person who had died of a typhoid fever, the paper is more of an assumption than a demonstration.

I. An early knowledge of the presence of a communicable disease is a great help to prevent the spread. Compulsory notification of certain diseases by the physician in charge should be insisted upon. Personally, I think the physician should receive a fee for this notice.<sup>1</sup> The physician should be compelled to report all cases on which there might be a mistake in diagnosis. Thus, chickenpox should be reported as well as smallpox; and in diphtheria, not only pseudo-membranous croup, but even that more frequent and comparatively harmless affection, frequently named diphtheritic sore throat. Under proper care no harm will result from the reporting of any non-communicable disease; many lives may be saved should there be a mistake in the diagnosis; and a source of temptation removed from a physician who might desire to save his patient from the surveillance of the health officer.

II. Having received the notification, the health officer visits the house as soon as possible, and in the case of diphtheria:

A. Separates the sick and the attendants upon the sick from the apparently well; this may require the removal of the sick to a hospital.

B. Having brought with him a number of prepared tubes, he inoculates as many as may be required with the throat secretions of every member of the family, and quarantines the whole house until the bacteriologist can report on the result of the inoculations, a matter of 24 hours.

C. He has a consultation with the physician in charge (it is always desirable, if at all possible, that the physician be present when he makes his inspection) and suggests the use of antiseptic sprays to the noses and throats of the apparently well. Personally, I think it is not wise for the health officer to make any suggestions as to the treatment of the disease other than the sanitary treatment.

D. If the patient is to be kept in the house, he directs the isolation. The character of this depends upon the nature of the disease. As the bacillus of diphtheria is not carried by the air, the isolation can be as effectively carried out in two rooms as by quarantining a house the size of the Vatican. One room for the patient, the other for the attendants to change their clothes before mingling with the other members of the family. He satisfies himself that the nurse understands the importance of disinfecting the discharges, especially, in this instance, those from the throat and nose, and sees to it that the method employed is effective. The extent of the restriction of isolation depends to a large degree upon the intelligence of the

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<sup>1</sup> "The local authority shall gratuitously supply forms of certificate to any medical practitioner residing or practising in their district who applies for the same, and shall pay every medical practitioner for each certificate duly sent by him in accordance with this act a fee of two shillings and sixpence, if the case occurs in his private practice, and of one shilling if the case occurs in his practice as medical officer to any public body or institution." Infectious Disease (Notification) Act, 1889. 52 and 53 Victoria. Chapter 73, section 4, paragraph 2.

family and their willingness to assist in the conflict. Every needless restriction only makes the perfect isolation more difficult.

E. When the bacteriologist makes his report, the quarantine is raised from those whose throats were free from the pathogenic microbe; this rule includes the person who is ill. If the isolation has been properly observed and the throats sprayed, the chance for infection in the interval between inoculating the tubes and the report is so slight that it may safely be disregarded. If any of the apparently well are found to have the diphtheria bacillus in their throats, they are immediately isolated and referred to a physician.

F. At the first visit the house should be placarded. If it is thought best to indicate the name of the disease on the card, then, as in this scheme, diseases possibly of no menace to the public health are to be reported, it would be well to have one form of card at first and another when the nature of the bacillus has been determined.

G. If the patient has been attending school or working where there are several others employed, the inspector should visit the school or workshop and inoculate another set of tubes from the throat secretions of every one in the room. The result of the examination of these tubes will determine whether any further precautions shall be taken.

H. When the disease is conquered and the patient has recovered, the isolation is to be continued until the cultures show the throat free from the diphtheria bacillus, be that two weeks or as many months.

I. Should the patient die; for some reason, as yet not explained by our hypothesis, a spread of the disease has been traced to public funerals—the funeral should be private.

K. There should be an actual disinfection of the articles that possibly could have been infected. There is so much disinfection, so-called, that is only a pretense for disinfection, that the subject cannot be properly treated in a paragraph. A friend of mine who was on duty as surgeon in one of our Pennsylvania hospitals had a case of a severe wound of the foot, caused by a mowing machine, brought to him at the hospital. The patient was attended by the physician who had applied the first dressing; the leg and foot were wrapped with a roller bandage *secundum artem* and was redolent with the perfume of iodoform.

"You are going to undo the bandages, are you?" exclaimed the accompanying physician, "the wound is dressed with strict antiseptic precautions."

My friend replied that as the care of the case would devolve upon him, he would be better satisfied were he able to see the extent of the injury. And under the bandage, carefully covered by iodoform,

in the very wound itself, were several pieces of grass. That was surgical antisepsis, but much of our sanitary disinfection is hardly on a par with it; I have the space only to repeat, let the disinfection be actual and not merely a process called disinfection.<sup>1</sup>

Now I am quite sure that many of you have mentally made the criticism that the method outlined by this paper is not practicable; it involves facilities that you do not possess; the whole thing is visionary and a waste of your time. The objection at first glance does seem to be a valid one. Those of you who are physicians will recall reading, from time to time, in the journals, of some operation—an amputation most likely—performed away out in the woods, miles away from help and instruments, where the doctor has been compelled to operate by the light of a smoky coal-oil lamp held by an old woman who was his only assistant. He has had to administer his own anesthetic, use the knives of his pocket case, and a carpenter's saw, fortunately at hand. And the patient recovered with a useful stump. All hail to the man who has the knowledge and the grit to be able to do this! And to the other who struggles with some desperate case of midwifery beyond the reach of help, and conquers. But would you have a physician, in a paper before some medical society, advocate these methods as the normal procedures in such cases? Would you not rather spend your time in reading a book like Robb's "Aseptic Surgical Technique," although in your own operations you will never be able to have all his appliances, than a paper on antisepsis by the doctor who mingled grass and iodoform in his dressing? Let us study the best methods and we will show the accuracy of our knowledge and the ability we possess by making the best use of the means at our hands.

Permit one suggestion more. It is well known that all the individuals exposed to any infectious influence do not contract the disease; the reason why it is so is not so clear. That there must be a definite reason which, if known, would enable us to predicate those who would escape the influence of the infection to which they had been exposed is plausible. Further, if this reason were known, it might help us to learn how to secure the immunity now possessed by some, and so prove one of the most efficient agents in the sanitary treatment of disease. To strive to banish pathogenic microbes from contact with man is to pursue an *ignis fatuus*; to learn how

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<sup>1</sup> Since this paper was prepared the American Lancet, for January 1st, has been received, containing a paper on "Prophylaxis Diphtheria," by Dr. George Duffield, of Detroit. Dr. Duffield's points are:

1. Bacteriologic Diagnosis.
2. Quarantine of Quarters.
  - Isolation, absolute, with one nurse.
4. Better disinfection, to be under the charge of the health officer.
5. The notifying of the pastors of churches and the superintendents of Sunday-schools of the disease and its locality.
6. The establishment of the overflow drinking-cup in all our schools.

to prevent the microbe working harm, if present, is a subject worthy your study.<sup>1</sup>

In discussion Major Veale said:

"It occurs to me that this is one of the most important papers that possibly will be presented to this convention. There are doubtless there suggestions, while the doctor himself suggests that this convention may look upon them as rather visionary, it strikes me as nothing at all visionary, but practical good common sense. A communicable disease is a preventable disease, and if the means that are suggested in that paper are adopted as far as they possibly can be, and there is scarcely one that cannot be adopted in the State of Pennsylvania in the smallest borough where at present there is a health organization, health officer or a physician. Consulting with the family physician, ascertaining whether the diagnosis has been a perfect one, ascertaining whether it is positively a communicable disease or not, and then applying isolation in the house, or in the hospital where that is possible, and then treating the balance of those in the house or connected with the family or those connected with the patient, or in every possible way as the doctor has suggested, all of the surroundings, and then treating, as he says, by disinfection and fumigation; that is, actual, and not simply pretended, and you will find that these communicable diseases will be brought under subjection, and they will be prevented. A time may come, although the doctor suggests that as a visionary, the time may come, and I think it will, although possibly not in the history of our lives, when a communicable or preventable disease existing in a community will be considered almost a phenomenon. But, in order to have this performed in large cities, a co-operation of the physician, the families and the school teachers, and those with whom the parties will come in contact is necessary. One of the most difficult problems to be solved, so far as communicable diseases are concerned, is to have the co-operation of the entire community, and especially those who have charge of schools, churches, and the physicians themselves. There is one thing frequently standing in the way of superintending communicable diseases, and that is the fact that physicians themselves do not in every case co-operate with the health authorities. There is, on the part of a large number of the community, an idea that if there is a contagious disease in their house that they are looked upon in a certain degree of disgrace, and further, a great many people consider that as soon as they are quarantined, and as soon as the physician returns to the health officer a contagious case, that from that moment their social intercourse, etc., are broken

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<sup>1</sup> An excellent paper on "Predisposition to Infectious Diseases," by Chas. J. Foote, M. D., is to be found in *The Atlantic Medical Weekly*, January 5, 1896.

Also an editorial article on "The Nature, Action and Specificity of Alexins and Antitoxins," *Med. News*, January 12, 1896.

up. This prevents the physician from returning the case in the first instance. Well, now, if the case is not reported, it follows, as a matter of course, that all of the suggestions made by the doctor are inoperative, because they cannot be put into effect. But, if we could we should co-operate with the physicians and families. Next, there is another great factor—that is, the mothers are so desirous that their children, for instance, if in school, shall not be kept out; if so they will lose their promotion, and the teacher is just as anxious that those children shall be there with their class who are going to be promoted with them, that the parents insist upon those children going to school.

“If these suggestions can be seriously and earnestly taken into consideration by every one having charge, directly or indirectly, of health authorities, my own opinion is that in a very few years communicable diseases would be almost a thing unknown. I consider it one of the most important papers that possibly can be presented to this convention.”

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### COMPULSORY VACCINATION.

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Moses Veale, Esq., Philadelphia.

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It needs no argument to prove the undoubted right of the law-making power to compel, by penalties, all persons to observe and keep such rules and regulations as will best protect the public health and human life.

In the very earliest dawn of the human existence, the divine penalty was imposed in the very first case where human life was taken and the murderer heard the awful words: “And now art thou cursed from the earth.”

Human life is the most precious of all possessions, and the greatest offense known to God or man, is to unlawfully take it, impair it or interfere with its enjoyment.

The only question to be determined in considering the proposition of compulsory vaccination is: Will vaccination protect public health and human life?

We are fortunate in having this question determined beyond a doubt in the affirmative, and I will summon to take the witness stand the best expert in the land, Dr. William M. Welch, physician in charge of the Municipal Hospital for Infectious Diseases, Philadelphia.

Qualified as an expert by being in charge from 1870 to the present time, and during this time treating, studying and classifying between five and six thousand cases of smallpox, "his testimony will be in favor of the value of vaccination as a protective and modifying agent in smallpox."

His first statement is this:

TABLE 1.—*Showing the Cases Divided into Variola and Varioloid.*

Disease.	Admitted.	Died.	Per cent. of deaths.
Variola, . . . . .	2,831	1,584	54.18
Varioloid, . . . . .	2,169	28	1.29
Total. . . . .	5,000	1,562	31.24

"All unvaccinated cases, all malignant cases and all vaccinated cases in which the eruption advanced to the pustular stage was attended by well marked secondary or suppurative fever have been classed in the table as variola, while all the vaccinated cases in which the eruption was markedly abridged in its course and in which there was little or no secondary rise of temperature have been classified as varioloids.

"The conclusive evidence of the protective power of vaccination that frequently came under my notice while observing these five thousand cases of small-pox, such, for instance, as witnessing on the one hand, an unvaccinated person suffering from the confluent form of the disease, loathsome and offensive, with the final issue for several days uncertain, and, on the other hand, a vaccinated person undergoing a modified form of the disease, so mild and innocent in its character as not to excite any apprehension for the safety of the patient. In the former case, if recovery took place, the individual was left disfigured for life; while in the latter, after a few months had passed, there was but little, if anything, in the appearance of the individual to indicate that he had ever suffered from the disease at all.

"Also, I have seen over and over again, entire families brought into the hospital when all the unvaccinated children have been suffering from small-pox and the vaccinated children unaffected; have seen the former perish and the latter remain exempt from the disease, although living, eating and sleeping in the infected atmosphere for several weeks. But I have yet to see a single unvaccinated child escape the disease under similar circumstances. Furthermore, I have more than once seen a vaccinated infant draw its daily supply of nourishment from a mother suffering from varioloid, and the infant remain as free from any symptoms of the disease as if the in-

fection were a thousand miles away and the food were received from the most wholesome source. All this is evidence of the prophylactic power of vaccination that cannot be shown in mortality tables.

"The more positive evidence of the efficacy of vaccination is to be found in the fact that persons recently vaccinated with effect do not take small-pox when freely exposed to the infection. During my service of twenty-three years, no resident physician of the hospital, no nurse, laundress, cook or any other employe who was properly vaccinated before entering on duty has taken small-pox. Perhaps I should except a female nurse who was vaccinated on the first day of her residence in the hospital with almost typical result. In the course of about two weeks I noticed on the forehead of this nurse, near the edge of her hair, one or two variolous vesicles, which were preceded by but little if any febrile disturbance. At any rate, she was at no time disabled from performing her usual duties.

"What vaccination has done for these employes, whose duties have necessarily brought them into the closest possible contact with the infection of small-pox, it will do for any or all who fully avail themselves of its protective influence. I am firmly of the opinion that if all persons were properly vaccinated in infancy and again at the age of puberty, Jenner's prediction as to the power of this agent to extirpate small-pox from the globe would soon be realized."

The following is upon the authority of Dr. Beveridge, an eminent Scotch physician:

"Between November 10, 1893, and August 20, 1894, there were admitted to hospitals 383 small-pox cases, of which 217 were males and 166 females, 69 being under fifteen years of age. There were 50 deaths, or 13 per cent., indicating a severe type of the epidemic. The mortality among the males was 15 per cent., and among the females 10 per cent. The number of vaccinated patients was 332, of whom 25, or 7.5 per cent., died; 20 were unvaccinated, of whom 10, or 50 per cent. died, and 31 were returned as doubtful, being reported as vaccinated but bearing no marks, the deaths among them being 15, or 48.3 per cent. Among the 54 vaccinated subjects below 15 years there were no deaths, the number among the 13 unvaccinated being 7. The degree of vaccination had an important effect. Among those who bore 'one good vaccination' there were 75 cases and 6 deaths, or 8 per cent. Among 28 with 'one indifferent mark,' there were 8 deaths, or 28.5 per cent. Among 134 with 'two good marks,' there were 8 deaths, or 5.9 per cent. Among 28 with 'two indifferent marks,' there were 2 deaths, or 7 per cent. Among 9 with '3 (and one with 4) good marks,' there were no deaths. And among 4 with '3 indifferent marks,' there was one death, or 25 per cent. With mothers suffering from small-pox, 9 infants were taken to the hos-



pital, and all having been vaccinated, there was no case of small-pox among them. There was no case of the disease among persons who had been successfully re-vaccinated. Of about 50 nurses and servants connected with the hospitals, all had been re-vaccinated and all escaped the disease."

The board of health of Philadelphia, of which Dr. William H. Ford, Dr. Rene LaRoche and Dr. James A. McCrea were members, in the annual report for the year 1873:

"The board of health pray for authority to enforce vaccination. They are aware of the objections to compulsory legislation that affects the freedom of action of individuals in personal matters, but the law must protect those who do not protect themselves and must prevent them from endangering the health of the general community. No individual has the right to indulge his prejudice or use his ignorance to the detriment of his own life or that of his neighbor. 'In the opinion of most physicians, and of many of the ablest judicial minds, public vaccination and the means for rendering it universal, constitute one of the few obligations in which the duty of the individual and the duty of the society or the State are so reciprocal and so absolute that compulsory regulations requiring it are not inharmonious with the spirit of the laws.'"

Dr. Alvah H. Doty, health officer of the city of New York says:

"To one who has carefully investigated the subject, it is evident that the people of this country are not properly protected by vaccination. The apathy shown in this matter is surprising when the large mortality from small-pox in the unprotected is considered, as well as the simple manner by which protection may be afforded. Many children remain unvaccinated as late as the fifth or sixth year and re-vaccination receives practically little consideration.

"In the city of London from 1790 to 1800 the average death per 100,000 was 712. The average in 1883 was 3.4 per cent. Primary vaccination, but not re-vaccination is compulsory in England, while in Germany both are compulsory.

"Primary vaccination, compulsory in London, shows deaths in 1883 per 100,000 of the inhabitants 3.4 per cent. Primary and re-vaccination, compulsory in Berlin, shows the deaths in 1883 per 100,000 inhabitants 0.3 per cent.

"From the evidence submitted, it is conclusively proven that vaccination prevents the spread of a loathsome disease, saves lives and contributes to the preservation of public health. This being the case, it follows inevitably that neither prejudice, ignorance or any other personal consideration can intervene to prevent the law making power which has been lodged by the people with the Government of the State, to make all needful regulations touching the security of public health and human life.

"This power in the state is qualified only by such conditions as to the manner of its exercise as are necessary to secure the individual citizen from unjust and arbitrary interference."

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## THE BEST MEANS OF EDUCATING THE GENERAL PUBLIC IN MATTERS OF PRACTICAL HYGIENE.

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By M. G. Lippert, C. E. Phoenixville.

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Under hygiene we understand that branch of science which treats of the promotion and preservation of health. If the first requisite to human happiness be good health, then it is hard to conceive of any branch within the entire range of science that could in importance outrank, or even rank abreast, with hygiene.

To quote from Sir John Simon's report to Parliament on the sanitary condition of London, which is referred to in a most able article from the pen of Mrs. H. M. Plunkett in the January number of "The Popular Science Monthly," called "Twenty-five Years of Preventive Medicine," which I desire to commend to the attention of all sanitarians, members of the legislature and all municipal authorities throughout the State. "Ignorant men," says Sir John, "may sneer at the pretensions of sanitary science; weak and timorous men may hesitate to commit themselves to its principles, so large is their application; selfish men may shrink from the labor of change; wicked men may turn indifferently from considering that which concerns the health and happiness of millions of their fellow creatures, but in the great objects which it proposes to itself it transcends in importance all other sciences, and in its beneficent operation it seems to embody the spirit and to fulfill the intentions of practical Christianity." And yet, notwithstanding this obvious fact, there is, as a general thing, less time bestowed upon the study of hygiene than, perhaps, upon any other branch of science. The amount of ignorance of even the first principles of hygiene that exists among the people, otherwise intelligent and well informed, is simply astounding to the professional and practical sanitarian, and inasmuch as indifference is the natural and direct result of ignorance, it is no wonder that he finds it up-hill work to interest the public at large in sanitation and receive the public support that is absolutely indispensable to general sanitary reform. It follows, then, that the

first step to be taken is to educate the general public in matters pertaining to practical hygiene, and the only question is, how this is best to be accomplished. There are, no doubt, a number of ways to do this, although those enumerated herein strike me as, perhaps, the most effective.

As is the case with education in general, we have to look to the schools to lay the foundation in the pupil to an understanding and appreciation of sanitary science. Hence, hygiene should figure as an important branch of the curriculum. Now, while it is true that, what is called "physiology and hygiene," is taught in the public schools of Pennsylvania, it is really nothing more nor less than a series of temperance lectures on the dangers resulting from the use of alcohol and tobacco, while other principles of hygiene equally important to the preservation of health are only scantily treated and, perhaps, soon forgotten again by the pupil. Those of my hearers who attended the convention of this association one year ago, cannot fail to recall the timely and emphatic protest that was given utterance to on this floor by a member of the State Board of Health, himself connected with a leading educational institution of this State, against this narrow and time-wasting form of instruction that excludes from our schools standard text-books of hygiene, like Dr. Hunt's or Dr. Lincoln's, recognized as such almost universally, except with us. Whether that protest has been heard and heeded beyond the limits of that convention I am not in a position to state; at any rate, it seems to me, that an effort should be made by this association to impress our legislators with the importance of amending existing laws so as to allow of a more rational mode of instruction in the branch of hygiene with the aid of such standard text-books as have been referred to above.

If the science of hygiene properly taught, once be assigned the position in the curriculum commensurate with its importance, it can only be a question of time, when, with the growing up of the young generation, it will begin to exert its beneficent influence upon domestic as well as public life.

Yet, in the meantime, we should not sit with our hands in our laps and our hopes centered in future generations, but should bend our efforts on educating our contemporaries.

Here again various ways may be suggested. Much may, for instance, be accomplished by the dissemination of appropriate information on the part of the sanitary authorities of the State through the press, or by means of reports, pamphlets, circulars, leaflets, etc. In this connection, I desire to state, what is no doubt known by this time to all representatives of local boards of health, that our own State Board of Health is doing most efficient work in propagating information

upon hygienic and precautionary measures by means of thirty or more different circulars, some of these published even in three different languages (English, German and Slovak), which are distributed free on application to the secretary. These circulars have on several occasions proved a great boon to our own board in Phoenixville, twice during the recent cholera scare, once when we barely escaped an epidemic of scarlet fever, and quite lately when we were threatened with diphtheria, which was epidemic in a neighboring town only a few miles away from our borough, the two towns being in constant intercourse.

It is our custom in such emergencies to publish in the local newspapers either the entire text of the circular, or, at least, an abstract of the same. Of this publication we have at the same time a large number of slips printed at a very moderate cost, for distribution should the occasion call for it. I am quite certain that during such emergencies, these precautions are carefully studied by many anxious and panic-stricken people. Thus, it is at such times, if at no other, that the sanitarian gets his work in as an educator of the masses, although it is, to say the least, pitiable, that it should require nothing short of an epidemic to admonish us of the need of sanitary education and to dismiss all thought of it the moment the danger has vanished.

An important part in disseminating information tending to educate a large circle of readers is played by journals especially devoted to the subject of sanitation and hygiene, of which there are published a large number, such as "The Pacific Health Journal," of Oakland, Cal.; "The People's Health Journal," of Chicago; "The Journal of the American Health Society," and "The Boston Hygienina," both of Boston; "Good Health," published by Dr. J. H. Kellogg, Battle Creek, Mich.; "The Sanitarian," by Dr. A. N. Bell, Brooklyn, N. Y.; "Hall's Journal of Health;" "The American Analyst;" "The Dietetic and Hygienic Gazette," and "The Sanitary Era," all four published in New York; "The Annals of Hygiene," of Philadelphia; "The Popular Health Magazine," of Washington, D. C.; "The Texas Sanitarian," of Austin, Tex.; "The Texas Health Journal," of Dallas, Tex., and others, the names of which do not occur to me.

There are, moreover, many scientific as well as popular journals, monthlies, etc., that devote more or less space to subjects closely connected with hygiene and sanitation.

It stands to reason, that this immense amount of reading matter must fall on fertile soil here and there and ultimately bear fruit.

But, it seems to me, it is part of our duty to call the attention of the people of our respective communities to these publications and encourage them to subscribe to and read them, and to circulate them among their friends and neighbors. Much good, I am convinced,

could be accomplished in this way, much interest might be roused in sanitation, and this leads me to the next and, perhaps, the most important suggestion to attain this end.

Sanitary associations have been suggested as an excellent means of creating an interest in and promoting the study of hygienic matters. This idea is not at all new, but has found practical application in this country in many instances. The one most widely known is "The American Public Health Association," which a prospectus informs us "was organized in 1872 by a few public-spirited men who foresaw the need of bringing together in one body the ablest sanitarians of the country for the purpose of inaugurating measures for the restriction and prevention of contagious and infectious diseases, and for the diffusion of sanitary knowledge among the people. The growth of the association and the work it has accomplished more than justify its existence. Its membership has been augmented from year to year until it now constitutes the largest and strongest sanitary body in the world, and embraces in territorial extent the United States, the Dominion of Canada and the Republic of Mexico. Under the impetus given by its work, state and local boards of health and sanitary associations have been organized, sanitary publications increased and hygienic knowledge widely and extensively diffused. The association has already published sixteen large and valuable volumes, increasing at the rate of one volume a year, and containing the papers, reports and discussions presented at the annual meetings. In addition thereto, the association has published a standard work upon 'Disinfection and Disinfectants,' besides the Lomb prize essays now so widely known to the American public.

"Among its members may be found physicians, lawyers, ministers, civil and sanitary engineers, health officers, teachers, plumbers, merchants, etc., in fact every profession and many of the industries are represented in its list of members."

Sanitary associations of a local character are found in many of our large cities, the object of all being to promote the cause and study of sanitation, and all doing, no doubt, excellent pioneer work. But it is in the smaller towns and in the rural districts, where such a thing is comparatively unknown and yet sorely needed. There are, I am informed by the Secretary of the State Board of Health, to whose courtesy I am indebted also for other information used herein, "voluntary sanitary committees," at Wallingford, Delaware county, and Wayne, Delaware county. Still, these, I think, are more for mutual protection, and not so much for educational purposes.

I grant it may be difficult to arouse any interest in such an association with educational aims in a small town, to recruit members

for it, or keep up the enthusiasm that may even have existed while the thing was a novelty. It may require real heroic work and great perseverance to carry the attempt through to ultimate success.

But with such qualifications coupled with a good dose of common sense, tact and ingenuity in making the meetings interesting and attractive, there is no reason why the experiment should not be successful. A great point, in my opinion, is to interest the women in the matter and trust to their good sense, tact, influence and enthusiastic co-operation, when once their interest is aroused.

That the women are alive to the importance of public sanitation may be inferred from the fact that there is a "Women's Health Protective Association" in the city of Philadelphia, and another one of the same name in the city of Pittsburgh, both of which number among their members the most influential women of their respective cities. Through the courtesy of its secretary, I am informed that the immediate object of the Philadelphia association, which was organized in April, 1893, when an outbreak of cholera was feared in this country, was to improve the general sanitary condition of the city, especially in the matter of cleanliness. "To that end (I am quoting from her letter) the association asked for instruction during the first few months of its existence from the health officers, from the Director of Public Safety, from physicians, sanitarians and specialists of that class, the idea being to obtain an intelligent sense of our needs, our short-comings and the remedies most needed. In this second year we are trying to put this information to practical use, partly by assisting the city authorities to enforce neglected laws, partly by gathering information from other cities, and, in the light of their experiments and experience, trying to have our laws amended. Our water supply is bad. We have sought to interest the public in the question by providing speakers for lectures and lately for a mass meeting. At the present time we are planning two or three illustrated lectures upon the germs of various diseases, etc., etc." I considered this information of sufficient interest to quote it here in extract.

The Women's Health Protective Association of Allegheny County, Pittsburgh, Pa., does equally effective and excellent work in public sanitation and in trying to educate the people to a higher standard of cleanliness. It has been carrying on a vigorous warfare against the terrible smoke nuisance in Pittsburgh and Allegheny, has succeeded in having a new ordinance enacted providing for the regular and prompt removal of garbage, is interesting itself in favor of street cleaning, and has during the past year engaged in an energetic fight against what Dr. Prudden, of New York, calls "the offensive and disease breeding habit of expectoration." In all of these

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the most important of the sanitary and public health problems is, by a large margin, the lack of adequate sanitation. Sanitation is a problem of the most basic nature, and is emphasized in the International Sanitary Conference held in Chicago during the World's Fair. The conference was held at the University of Chicago and there adopted: *Resolution No. 1*—*To urge upon the people of the countries concerned the importance of completing our sanitary equipment, to encourage public health associations to aid the people in the attainment of healthy living in the home and*

the community, and to afford efficient and persistent support to the work of public health officials.

Second, that this Congress respectfully ask State and local Boards of Health to assist in all proper ways the formation of such organizations."

It is obvious that the establishing of such associations will prepare a fertile soil for the propagation of information such as is sent forth by the State Board of Health, inasmuch as it will at once reach persons already interested in, if not enthusiasts on the subject, who may, on their part, try to interest such of their friends as are not members of the association in the matter to be circulated; whereas, without the medium of such an organization, the greater part of the circulars and leaflets sent out will fail to reach those for whom they are intended, and will consequently be wasted.

Gentlemen of the local boards of health! Shall we not make an attempt to organize within our respective communities such associations as I have spoken of? Though it may take time, patience and perseverance, not to speak of the mental work and worryment, the result in view, if accomplished, will be more than an adequate recompense for all the trouble involved in the effort.

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## EXPOSED WATER SUPPLIES AND TYPHOID MORTALITY IN AMERICAN CITIES.

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By E. G. Matson, M. D. Pittsburg.

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Epidemic diseases, as every one knows, at the present time are attributed to certain forms of one-celled animal and vegetable life which enter the tissues and multiply in them and by producing poisons, cause the morbid manifestations. The minuteness and rapidity of multiplication of these organisms is at first sight out of all proportion to the laws which govern the living creatures which form a part of our ordinary experience. In reality, however, these visible animals and plants are made up of a coherent mass of organisms, each the centre of distinct but not individual vital activity and of the same order of magnitude as the bacteria and protozoa. The original cell from which these larger organisms started, divided into two and these two into four and so on in rapid progression precisely as the bacteria do, but with the difference that the descendants with



the exception of the few destined to become ova or oospheres cannot become the progenitors of new individuals. When the bacterium divides into two, each of these two when separated, can become the starting point of a new race. It is for this reason that a multitude of bacteria too small in bulk to attract notice can be disseminated through large volumes of fluids without altering their sensible properties and yet render them infectious even in small quantities.

Epidemic diseases extend by the implantation of these organisms upon such portions of our tissues as are susceptible to their attacks. Thus in the highly contagious diseases the throat is the first to be attacked. In typhoid fever, cholera and dysentery, the intestine. The acquisition of a disease thus depends upon receiving the living germs upon a living tissue which is incapable of entirely resisting their attack. When dead matter meets dead matter a uniform result inevitably follows. When living germs meet dead matter suitable to nourish them, the result is also uniform because the dead matter is incapable of resisting their growth; but when living germs meet living tissues the result is not uniform. This is a fact of capital importance. If all the members of the human race had been equally susceptible to disease, mankind would have been swept off the face of the earth long before their enemies, the bacteria, were discovered. When a child acquires diphtheria and of the three or four others associated with it all escape with perhaps a single exception, as often happens, this escape is not always due to the fact that the virus of the disease has not actually reached their throats. Bacteriological examinations have shown that the distinctive organisms are actually present and multiplying in some of these persons who nevertheless escape the disease. The same thing has been shown to be true of cholera. In small-pox when inoculations were practiced a few children proved refractory to this most contagious of diseases even after a second trial. Undoubtedly the same thing is true of typhoid fever, though at present we cannot prove it by bacteriological tests. To assume that uniform results will follow exposure to contagion is to neglect the most characteristic property of living things; their ability to adapt themselves to an adverse world.

This insusceptibility which we observe as a fact without understanding its nature is called natural immunity in contradistinction to acquired immunity which belongs to those who have survived an attack. It is probably relative and transitory rather than absolute and perpetual. In the experiments upon animals it is found that when a certain quantity of infection called the minimum fatal dose is injected, not only a disease, but a fatal result invariably follows. If less than this is used some of the animals survive.

It will be guessed what application these statements have to our subject. When a well is infected from a single individual, a draft of water is a large dose; and we sometimes find that every member of the household acquires typhoid fever and the majority die. At other times one or two persons die, one or two others have a well marked attack, while another has a brief nondescript fever which would not be considered typhoid fever at all if the case were seen separately from the others. It may happen also that some members of the household escape altogether.

In outbursts following infection of large volumes of water by a single case at least four-fifths of the population escape, generally a much larger part than this. This proportion of fatal cases to those attacked is less or at least less than the extremely high rates sometimes observed in more limited epidemics. In many of these outbursts anomalous cases of fever abound which, independently of the prevalent epidemic, would not be called typhoid fever. Unquestionably in this disease, as in diphtheria and cholera, there are many mild cases which are not sufficiently marked to justify a diagnosis by the practitioner. Indeed, all practitioners know that it is difficult to know just where to stop diagnosing this variable fever. From the standpoint of treatment these cases are not important, but from the hygienic point of view, they must be taken into account.

It will be gathered from what has been said that the fact that many persons drink suspected water and escape does not neutralize in any respect the force of the conclusions that may be drawn from the fact that others drink it and suffer.

The infecting agent comes from the sick in some excretion which we may term the virus. If the germs are not discharged alive the disease is not communicated. Thus malarial diseases cannot be conveyed from person to person except by transfusion of the blood. As a result malaria, though a germ disease, is not communicable. Diphtheria, scarlet fever, measles and the like are mainly contagious through the fluid exudates, etc., in the mouth. These diseases are easily conveyed by kissing, in coughing, and it may be spitting and carrying the hands to the mouth, as children do, and afterwards rubbing them on objects, the contagion is sure to be more or less distributed through the sick room. It is evident that these infecting agents are not very likely to reach the water supply. The soiled objects, for example, are boiled. On the other hand, the infectious excretion in typhoid fever and cholera are the diarrhoeal stools which are usually abundant.

Since typhoid fever has been distinguished it has been observed to not behave like the contagions just mentioned. It does not spread along the lines of association. The attendants constantly escape when they are not exposed in some other way than results from

being with the patient. On the other hand, it is distinguished by outbursts which far exceed the contagious diseases in the number of simultaneous cases which suddenly appear where, perhaps, not a single case was previously known. How then can a thousand cases arise from a single one when association with the patient so seldom is followed by an attack? It would probably be impossible for a single person to communicate a disease by contact in so short a time to so many persons even if all were trying to get it.

The simplest explanation is that the infecting agents are possibly with rare exceptions only present in an excretion which gives warning of its presence in the recent state, and is instinctively avoided by even the ignorant and slovenly, in which class young children belong. Small wonder then that the nurse escapes. Even the contamination of food would generally excite disgust.

On the other hand, when these infectious excretions are disseminated through a large volume of water or their faecal character has been lost in some way; even chemical analysis fails to distinguish their presence. Hence the unsuspecting water drinker may receive the disease from a patient whom he has never seen, at the same time that a multitude of others are exposed to the same cause. The theory of water carriage of this fever is established by virtually the same kind of evidence which has proved the poisonous nature of various drugs. We are not able to detect the infectious agents in the water, it is true, as a poison might be detected; but equally cogent evidence is the fact that these excretions from a typhoid patient have often been shown to have entered the water at a time corresponding to the reception of the infection by numerous persons.

These outbursts are, however, so different in intensity from what exists in many cities with a water supply exposed to more or less continual infection, that they do not seem a precedent to many minds. Why should typhoid fever infection reach the river at all and what probability is there that it would come to the water consumers in a dangerous form?

The infectious stools are deposited either in the earth or on it and in either way they are inevitably acted on by water. Many epidemics in the country have been shown to be due to infected springs. Every spring, however, is the head of an affluent of the river which must ultimately receive its infected waters. Again the attendants of the sick do not always deposit these wastes in the usual place. They are warned of the danger to the well which in the country is never far from the cess pool. In the accounts of many epidemics in the country the care taken by the sick man's family to protect itself is made evident. At Plymouth, the nurse cast the dejecta down a declivity to the brink of the stream. Overhanging privies are another very direct source. The infection which caused the epidemic at

Lowell was introduced into the river, according to Mr. Sedgwick, in this way. Sometimes there are villages with sewer outfalls directly into the stream. When we consider all these facts which are more or less the result of common observation, we must consider the entrance of infection into streams draining inhabited, water sheds as a menacing possibility which rises to a continual danger as soon as typhoid fever becomes prevalent and has established endemic centres in the large populations of the water sheds from which many of our cities derive their supply. When the whole number of annual cases is small, as is necessarily the case in a water shed of limited area, and a scattered population for a long series of years not a case might be situated so as to introduce infectious material into the water except where it is filtered out again by the action of the soil before it can reach the stream. In towns furnished with water from such sources we do not find typhoid fever abundant among the consumers in ordinary years. Yet it is precisely in such places that the exceptional outbursts already referred to appear after years of immunity. When the population reaches 5-600,000 as is the case with the Allegheny water shed above Pittsburgh, the danger becomes an annual certainty. The usual rural death rate from typhoid fever is 3 or 4 per 10,000 living. This would give an annual total of not less than 200 deaths in the Allegheny valley, which implies from 1,500 to 3,000 cases of the disease. In 1880 there were actually 180. We can make large allowances and yet believe that such a stream must be infected several times a year by some of these cases. Reasoning from the fact that exceptional outbursts have often been traced by most positive evidence to small streams we might apply the rule of three. If 1,000 persons infect a stream so as to cause an outburst of typhoid fever in those who drink of its water once in a century, how many times in a year would there be similar infection from 600,000 persons.

There need be no question that this infection actually enters our rivers every year, but it does not reach the city, except when it enters very near the intake pipes, which I assume all would admit dangerous? Many of you have thought just now that the fact that outbursts of typhoid fever involving 5 or 10 or 15 per cent. of population in such cities as Philadelphia and Pittsburgh do not come every year or any year, is evidence that the infection does not reach the people in an effective form, although it must enter the river. In addition to the natural immunity already spoken of there is the acquired immunity which results from having survived the disease. In consequence, a population which is so much exposed as an annual infection of the water supply implies is largely made up of individuals who have a natural or acquired immunity from this disease. If it were not for the change in the population by birth and immi-

gration, typhoid fever would ultimately cease to exist in such a place. If we compare the 1,228 deaths from typhoid fever that took place in Pittsburgh in the five years ending with 1892, with say 40,000 increase in population, we get a different result. Well nigh half this population must have had the disease.

It was formerly believed that a contaminated water would purify itself after flowing a few miles in a river. This belief was based on the observed fact that the excessive organic matter in sewage largely disappears. More recent investigations have shown that though this belief is true to some extent, yet days and weeks are necessary to bring about a disappearance of typhoid infection.

This has been best shown by the effect of typhoid fever in Lowell upon the inhabitants of Lawrence. Both these cities take their water from the Merrimac river, which receives the sewage of Lowell before it reaches Lawrence. In addition, the water is detained for nearly two weeks in the Lawrence reservoir. The sewage of Lowell thus is purified by dilution in a large river and a flow of nine miles; in addition is the stay in the reservoir and the distributing pipes. None the less, year after year, the season of prevalence in Lawrence shows that a large part of the cases in that city are derived from Lowell. Mr. Sedgwick showed from a light epidemic in Newburyport that this purification is far from complete in a distance of twenty-five or more miles.

Water is, however, not a suitable breeding place for typhoid fever germs. Thus the laboratory experiments show that if these bacilli are introduced into it they die out progressively, but not until after weeks. The actual period in the experiments varies considerably, doubtless with varying conditions, but I have not seen it put down at less than fifteen days. But it is not at all necessary that disease germs should have breeding place outside the bodies of men and animals. Thus consumption is very prevalent, yet the germs to which it is due will not increase under a temperature of 95 degrees, which is never maintained for any length of time in temperate climates. Some epidemics of typhoid fever show that these organisms may be present in the excretions in sufficient numbers to infect large volumes of water without intermediate multiplication. Thus the stools of the patient who gave his disease to more than a thousand persons at Plymouth were frozen until almost the moment of infection of the inhabitants. Multiplication under these circumstances was impossible. Yet there were enough to be effective.

The typhoid fever germs are not destroyed by drying or freezing. In consequence accumulation of infectious excretions may lay a whole summer or a whole winter to be swept into the stream with the first rain or thaw.

The role of the river is to act as a carrier; it brings us a disease

from the up river population, who in turn come to the city and acquire it, and so prevent all tendency to extinction in their own neighborhoods. Cases a hundred miles away cannot have the same influence as those within a mile, yet they must have some effect.

When we consider this mechanism of infection by water, I conceive there is but one thing which could break it down, and that would be an actual non-existence of typhoid fever in places with a water supply from large streams. If we except some recent cities in the west, where there may not yet have been time for this disease to be thoroughly introduced into the surrounding country, there are no places with such supplies in which it is not very prevalent.

The manner of direct contagion is very readily understood and the belief that it occurs has sunk so deeply into the minds of the people, that the escape of children who have been associated with diphtheria or scarlet fever cases as frequently happens, does not diminish it. The same allowance, of course, should be made in all communicable diseases, including those propagated indirectly.

I will turn now to the evidence which serves to show that unpurified river water is capable of causing the degree of typhoid fever which we actually find prevalent in places with pumping works and short storage. The explosive epidemics, such as that which occurred in Plymouth in 1885, are more easily shown to be due to infected water considered as isolated facts. Yet the very intensity with which they rage for a time leads many persons to suppose that there are no water epidemics of less intensity. These explosive epidemics have been shown to be the result of infected water by establishing first, that the infection actually entered the water on a given date; second, that the cases began about eight or nine days after the infected water could have reached them and rapidly increased during the next week and then diminished again three or four weeks after the infection of the water ceased; third, that though the majority of the consumers of the water escape when their number is large, yet a much larger proportion have typhoid fever than in ordinary times when the water supply was not infected; fourth, that the cases are so widely distributed that no large section of the population using the water escapes altogether; fifth, that in the earlier stages cases are not found among those who did not drink of the water or at least not more than have existed at other times. Later in the epidemic there may be secondary cases, of course.

This mode of investigation is only partly applicable to the continuous prevalence of typhoid fever in one year. In regard to the first point, it has already been shown that the infection must enter the river when it drains a numerously inhabited area, and all known facts show that it will not die out before the contaminated water can

reach the consumer, provided there is no provision for detention in storage basin for a period longer than two weeks at least.

In regard to the second feature of explosive epidemics, we cannot expect marked expansions and recessions when the infection is frequently introduced. The prevalence of typhoid fever doubtless varies considerably. Unfortunately, we have no data from which to form an idea of the relation of the prevalence in city and country. There is one fact, however, which bears on this question. Typhoid fever, where it is due to internal causes, is most prevalent in autumn, and this is the case in the country wherever statistical evidence exists. If this is the case, the maximum season of prevalence would be expected later in the city than in the country. It is true that the interval is not necessarily long and would not be longer than two or three weeks, if the infectious matter were at once introduced into the stream. But this is not always the case, and between dry weather and freezing weather, the infection may only appear in the river after some time. On this account we should expect typhoid fever to continue into the winter where the water supply is at fault. Mr. Mills has called attention to the late appearance of this period of maximum intensity in Lowell, as compared with Boston, which exhibits a more normal curve. In Lawrence, before the introduction of a filtration plant, there was a still later maximum which for a series of years corresponded to the interval it would require for the water infected at Lowell to actually reach the Lawrence consumers and the time which must further elapse before the disease becomes manifest after the reception of infection. In Pittsburgh, the average of twenty-one years places the maximum in September, but, on the other hand, the averages of the subsequent months are very high. In several different years the maximum prevalence falls in the winter months. The second highest mortality known in a single month was December, 1887 (52); the fourth was also December and the fifth was January. In February, 1890, a slightly higher death rate was reached than the previous autumnal rate. The Pittsburgh rate for that month was fourteen times that of Boston, while the previous autumnal maximum was not quite twice that of Boston at the same time. I regret that there are not more exact data from which conclusions might be drawn.

While there are not any very definite data in most of our cities showing the power of river water to produce outbreaks on account of the continual use of this water, there are some facts exactly equivalent in force. There are the epidemics which have followed the temporary introduction of river water into pipes which previously carried a water not exposed to infection.

Vienna suffered severely from typhoid fever before the introduction of water from the mountains in 1874. This was followed by a

great decline. In 1878, however, river water had to be used by part of the population. An epidemic of typhoid fever with 350 deaths was the result. Unfortunately, Dr. Kammerer, from whose article in the *Wiener Klinische Wochenschrift*, Nos. 40 and 41, 1894, I take these facts do not state the number who used this water. It was certainly a considerable part of the population, however, and the epidemic was probably not severer than exists in average years in many American cities supplied by pumping works.

More recently Berlin had a similar experience. Here the water was forced through the sand filters at double the rate at which experience has shown that germs can be removed.

Paris has two systems of supply; one for domestic purposes derived from springs in the valley of the Seine; the other for other purposes derived from the rivers Seine and Maine and the Canal de l'Ourey within the city limits. Unfortunately, the spring becomes inadequate several times a year, and then the supply is maintained by drawing on the river water. I will quote a single instance given by Dr. Schneider, illustrating the consequences of the change of water on the Paris garrison, numbering 18,000 men.

In October, 1889, the number of cases of typhoid fever in the troops at Paris was ten. From October 31st to November 5th, Seine water was distributed all over the city. From November 22d to December 12th, seventy-five cases were reported in the garrison. There were thus four cases per thousand. It is borne in mind that the period of life when the susceptibility to typhoid infection is greatest lies between the fifteenth and twenty-fifth year, and that the Frenchman performs his military service in the middle of this period four cases per thousand in the same month will not seem greater than what often occurs in American cities using river water. This greater susceptibility of the soldiers, due to their age, is also evident from the different death rates of the civil and military population of Paris. In 1890 there were 3.2 deaths to 10,000 living in the civil population as against 10 in the garrison. This would indicate that there are three times as many cases among the young soldiers as in the population of all ages, which is also in accord with experience. We may say then, that here was an explosive epidemic affecting just the same proportion of the population in a single month as in our cities which use river water.

In January, 1893, 28 cases of typhoid fever were reported in Newburyport, Mass., as against 4 in the preceding month and none in the month before that. Typhoid fever is not a common disease in that city. Just before this 70 cases were reported in Lowell as against 19 in the previous month. Lowell is about 25 miles up the Merrimac from Newburyport. Prof. Sedgwick attributed this slight epidemic to the introduction of Merrimac water into the pipes of Newbury-



port, which had been made necessary by the partial failure of the ordinary supply. In this little epidemic not quite 2 per 1,000 were affected, this would be about 500 for Pittsburgh. Exposed to the same risk, however, Newburyport would necessarily suffer more than Pittsburgh on account of the greater number of persons in the latter place who have acquired immunity from a previous attack. There have been as high as 62 deaths in a single month in Pittsburgh, 25 to 30 are quite common; this would correspond to 3 or 4 cases.

The remaining three features of explosive epidemics may be considered altogether. In the cities under consideration more than one kind of water is always used. Thus some persons use habitually only boiled water, others purchase spring water. So far as I have been able to make inquiries, these people are remarkably exempt from the disease. But there are no official data. Otherwise there is no opportunity for comparison within the city itself. For the well and spring water of our cities must be regarded as dangerous, and to show that the persons who use such water suffer more than the remainder of the population would not exculpate the city water. Water can undoubtedly be more highly infected than is ordinarily the case with river water.

On a comparison of the mortality rates of cities which have pumping works and others which draw their supply from areas with a scant and small total population will yield evidence of the same nature.

Of the seven cities on the Merrimac, Lowell and Lawrence derive their water from the river. In the five years ending in 1893, the typhoid mortality rate of these cities was 10.66 and 12.72 per 10,000 living, the others varied from 2.95 to 4.77. Since the introduction in Lawrence, that city has ceased to contrast with the other places while Lowell has gone on at its former rate. In the same while New York has had, of late, an annual average of 2.5 and Brooklyn 2 per 10,000, in Jersey City, which uses river water, the average annual rates was 7.9 for the three years ending in 1893. In the same way we may contrast the annual average of Albany, Troy, Philadelphia, Washington, Pittsburgh, Allegheny, Cincinnati, Louisville and others with Boston, New York, Brooklyn, New Orleans and many of the cities of Massachusetts. The contrast is still stronger with the European cities in which the use of well water has been suppressed. Of the greater European capitals only Paris has at present a greater death rate than 2 per 10,000 living; we have seen that river water has been in part resorted to by Paris.

How low the typhoid fever mortality of a crowded city with an ideal water supply may become Vienna will illustrate. From 1850 to 1874, there were seldom less than a thousand deaths from this cause in that capital. There were two years in which fifteen hundred

were exceeded. Since 1874, the supply has been drawn from the high springs in the neighboring mountains and the use of well water suppressed. In spite of increase in population the number of deaths from typhoid fever has constantly decreased. In 1878, 200 deaths were exceeded for the last time. Since 1885, the total number has not exceeded 100. Dr. Kammerer also gives statistics from which persons acquiring the disease elsewhere, while the Viennese dying elsewhere from this cause are included. In the last four years the deaths really belonging to Vienna have varied from 48 to 63 per annum, figures which Pittsburgh, with one-sixth the population, has reached in single months.

That these contrasts are not coincidences can be shown by comparing other epidemic diseases which we know are not spread by water. Thus, there were 1,200 deaths from diphtheria and croup in Vienna in 1891. The following year there were 1,546. This is about equivalent to the Pittsburgh rate. On the other hand, consumption is much less prevalent in Pittsburgh and Allegheny than in any of the cities mentioned as having a safer water supply. Examination of the statistics of many cities shows that while typhoid fever, cholera and some forms of diarrhoea vary with the water supply, the prevalence of the other epidemic diseases have no such correspondence.

While water carriage of typhoid fever has been exclusively dealt with in this paper the writer hopes it will be understood that he does not mean to deny all other modes of connection. The facts given show that infection of a public water supply when it exists is the preponderant factor in the prevalence of this disease. Where the water supply is best, typhoid fever exists, but is a rare disease.

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## HOSPITALS FOR CONTAGIOUS DISEASES FOR CITIES AND TOWNS OF MODERATE SIZE.

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By J. C. Hutton, M. D., Harrisburg.

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This subject is one that presents a vast field for differences of opinion as to style, benefits, comforts and necessity. The larger cities being well equipped with hospitals for general and the different classes of disease seem not to require attention from the State Board, or its positive rules and protection. While small communities on account of the social conditions of the inhabitants do require the close and imperative service of the State Board, and the applica-

tion of its laws. Disease in smaller towns and cities has every avenue and condition favorable to its spreading. The quarantine rules are more difficult to enforce. The isolation of patients in private homes less faithfully obeyed. The jealousy of medical men more easily excited and expressed. The sympathy of neighborhood so quickly aroused in condemnation of sanitary efforts, and the work and methods of the local authorities hampered and misconstrued to a degree that works harm to the community. The negative knowledge as to the force and malignancy of disease seems to have sway and thus disease is extended. Curative medicine has had its trial for centuries, and found wanting, contagious diseases have grown riotous under its specific and diversified dosing, until preventive medicine and sanitary science stepped into the arena of misunderstood nature's wants and laws, learned lessons from the mighty rain storm rushing down the mountain and hill side through the fertile valley, washing the highways and sewers of towns and cities. Grasped knowledge from the changing winds of the heaven, utilized the fires of the earth and applied them to the alleviation and prevention of the scourges of men. This brings me to the hospital for contagious diseases, not a pest house, where man dreads to enter, entering dies. But a structure embodying all the knowledge of sanitary facilities, pure water, fresh air, thorough cleanliness, comfort, return to health. This is the form of structure I would ask your attention to for a few moments. To a building well constructed, inviting, containing baths, pantry, kitchen, dining room, disinfection, stone or sanitary wash tubs, wards containing beds, with clean linen daily, oftener if necessary, perfect ventilation, an ever changing atmosphere, fresh, pure, quieting the delirium of fever, reviving the drooping spirits, last but not least, a crematory, consuming all the foul air, all the liquid and solid offal, bath and wash waters, and kitchen garbage included. This is the form of hospital which you can erect. Assuring by this means isolation, removal of object of infection or contagion from the community; and by the strict enforcement of the rules and regulations of the board of health, eradicate and stamp out the scourge. This is the description of the Harrisburg Sanitary Hospital, with the highest record attainable—no deaths. This is the form of hospital for contagious diseases for cities and towns of moderate size at a moderate price. I have here the diagram of the building and appurtenances for your inspection. Thanks for attention and forbearance.

(It was found impossible to obtain the diagrams as exhibited by Dr. Hutton to the convention, but we hope at another time to give our readers a similar paper, when we may present not only these diagrams, but a full description of the hospital as it was exhibited on the occasion.—Editor.)

## THE PROPER USE OF DISINFECTANTS.

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By Benjamin Lee, A. M., M. D., Philadelphia.

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I have not prepared a paper to open this discussion. You had, as I understand, a very full and interesting treatment of the subject from the Secretary, in response to a question on this matter, and I shall not, therefore, feel it as important to go so much at length into this subject as I otherwise would; and yet it is quite possible that I may traverse again some of the ground over which he went.

There are two ways of putting out a fire. One is to throw a bucket of water on the first spark, and the other is to wait until the house is in flames and then call out the fire department and deluge the house with water, destroying everything that the fire has left and, perhaps, blowing up two or three houses in the neighborhood to check its progress. It is not very difficult to choose between these two methods. The man who throws the bucket of water is the public benefactor rather than the fire department. Now, it is exactly the same with regard to disinfection. Disinfection should begin in the sick room, not only in the sick room, but with the sick person, not only with the sick person, but with the discharges of the body from the sick person; and if that disinfection is begun early, there will very rarely be any necessity for the wholesale process of disinfection which corresponds to the action of the fire department. We must begin with the sick person, we must disinfect the discharges of the sick person.

The most important substances to be used in effecting this are bichloride of mercury (corrosive sublimate), carbolic acid, solution of hypochlorite of soda, quick lime; the best of which is solution of hypochlorite of soda. The last substance is extremely useful in all cases where we have infectious discharges from the throat, especially in diphtheria.

The discharges which it is most essential to disinfect in typhoid fever, in dysentery, in diarrhoeal diseases of all kinds are the excreta. In diseases such as smallpox, scarlet fever and diphtheria the discharges from the noses and mouth. The vomit and the feces should be received at once into vessels containing disinfectants. We should not wait for the discharges to take place. We should place the disinfectant in the vessel allow the discharges to be received in it and then pour additional disinfectant upon it. If it is fecal dis-

charge this should not only be done, but the fecal mass should be stirred up. With these precautions scarcely anything infectious will be conveyed from the body of the patient. It is possible that the nurse in handling the patient will soil her hands or her dress. The next object for disinfection, therefore, is the nurse; and she, whether she be a hired nurse or the mother or the sister of the patient, should never leave the room without the usual process of disinfection. If possible, she should remain in the room continuously until the case is removed. If this is not possible, then on leaving the room she should make a change in her dress. She should wash her hands and face, or still better, take a complete bath. She should spray and wash her hair and put on other clothing after leaving the room. She is then in a safe condition to mingle with others.

The physician himself is also a source of danger. There is a physician ill in this State at the present time with smallpox. There has recently been a death of a physician in the city of Philadelphia from smallpox. Within the last year smallpox has been conveyed to his own family by a physician, and has been conveyed to a patient by a physician; and, therefore, I say that the physician is a source of danger, and so convinced is the State Board of Health of this fact, that it has published a special circular addressed to physicians instructing them in the precautions they should take. The physician should never go into the room of a patient with smallpox, diphtheria or any contagious disease without removing his outside coat and substituting an India rubber coat which will button around the throat and which will go to the feet; and on leaving the sick room he should take the same precautions suggested to the nurse, of washing his hands and face and spraying his hair and beard with the disinfectant. His hair and beard in each instance should be sponged with disinfectant before he leaves the sick room. We have in this way destroyed the infection where it began, and in nine cases out of ten it will never spread beyond the sick room if it is cared for in this way. At the termination of the case, of course, the apartment must be disinfected. The two substances most generally used for the disinfection of the sick room are mentioned in each circular which the State Board of Health distributes. They are bichloride of mercury and sulphur.

The bichloride of mercury should be used in the proportion of two drachms to the gallon of water. That is the strength of it which is used for the discharges. It can be used somewhat weaker than that perhaps, say a drachm to the gallon of water for the disinfection of wood work, etc., of the room.

Great care should be used during illness not to stir up dust in the room. The most potent distributor of germs is the feather duster, very much used in all houses. The best possible way to clean sur-

faces in the sick room is with a damp cloth, and nothing else should be used.

The usual amount of sulphur used is three pounds to every thousand cubic feet of air space of the room. Of course, a little more than that will do no harm. Now we must bear in mind in "disinfection" that what is meant by that word is the "destruction of infectious material," and that nothing is a disinfectant that will not destroy infectious material, and that as we understand it now, infectious material is an infectious germ. We must, therefore, destroy it. The substance which I have mentioned, corrosive sublimate, will destroy germs. There are very few others that will do so except under certain circumstances. There are many other substances which are claimed as disinfectants which are not disinfectants, but which are antiseptics, and we must not be misled by any suggestions with regard to such substances. There are a great many commercial disinfectants which cannot be trusted. Although those substances are antiseptics and will prevent putrefaction, they are not destroyers of germs to any extent. They have an admirable use in distribution about premises, in foul closets; whenever we notice foul odors and wish to correct them they have a very important use, but they are not disinfectants, and when we are certain that we have disease germs present we must not satisfy ourselves by using them, but we must use the disinfectants themselves. Among the disinfectants may be classed quick-lime. It is the oldest known disinfectant. It has been used almost from time immemorial. Its use cannot be too highly encouraged. The very frequent use of quick-lime by the familiar process of white-washing, is one of the best possible means to render a house not liable to disease germs, and every portion of the house which can be white-washed should be frequently; because wherever we induce a condition unfavorable to the growth of the disease germ, we are just so far limiting the spread of infection. Quick-lime when fresh is a very potent disinfectant. It was found in the recent cases of cholera which occurred at the National quarantine, New York, that a solution of quick-lime placed in vessels in which the discharges were received was as efficient in destroying the germ as anything that was used. As this substance is so easily obtained in all parts of the State, I think it very important that its valuable character should be understood. The State Board of Health of Minnesota classes it among the most important disinfectants, and has issued a circular suggesting that the solution of it may be preserved by simply placing a little petroleum on the surface of the vessel, bucket or whatever it is, in which the dilution is made. Evaporation is thus prevented and the solution maintains its strength.

Chloride of lime, which is very commonly used, affords one method of using chlorine of which I have already spoken. In fumigation.

unless the isolation of the sick room has been made very perfect, it is important not to confine ourselves to the fumigation of the sick room, but to extend the operation to other portions of the house adjacent to it. I do not think, however, that fumigation in the cellar will reach every portion of the house, as has been stated. Every room that is to be disinfected should have fumigation, and it is essential that every crack and crevice of that room should be closed before the fumigation is commenced, otherwise the fumes will rapidly escape and your efforts will have been in vain.

• The State Board of Health in its circular which it issued after the recent flood, which suggested to boards of health the methods which they should take to prevent disease as a result of the floods, mentions disinfectants in this order: Fire, soft soap, chloride of lime, bleaching powder, solution of hypochlorite of soda, quick-lime, carbolic acid, bromine, bichloride of mercury, corrosive sublimate and copperas. You will observe we were not then dealing with diseases but with the results of the general distribution of filth in a room.

There is no such disinfectant as fire, and everything which can be burned, should be burned. Burial has been suggested. I do not consider that a safe alternative. There is a chance that at sometime the articles may be exhumed.

Soft soap was suggested as the next disinfectant, and this article really does play a very important part in the thorough cleaning which should follow an epidemic. In connection with the use of soap, of course all articles which do not admit of burning or which can be saved from flames and which can be boiled, should be boiled with soap. The free use of soap is, I consider, very important.

Then comes in order chloride of lime and bleaching powder, which is a very familiar form of disinfectant.

We also suggest bromine for the destruction of animal material which cannot be so easily reached because of its putrescent condition. After floods we find carcasses of animals in all stages of putrescence and it is often almost impossible to get near enough to handle them on account of the stench. They should, of course, be burned with the addition of resin, but in order to enable the persons who are to treat them to handle them, bromine may be used with the effect of stopping all putrefaction and decomposition and all danger of approach. I consider it one of the most valuable articles under such conditions; it is used diluted with water. It is a product manufactured to a great extent by all salt manufacturing companies, who furnish it at a very low rate. It is of great value in sprinkling in all foul holes and places, but it is to be used cautiously and should not be trusted to anyone without proper instruction on account of its irritant properties.

After a room has been disinfected it should be kept closed twenty-four hours. In that time the fumes will have sufficiently subsided to enable anyone to enter the room, and experiments seem to show that by that time all of the efficient action of the sulphur will have taken place.

With regard to the mattress and bedding, those in the room in which the disease occurred, those on which the patient had slept, should either be treated by heat in a chamber constructed for the purpose, which some of our cities are provided with, or they should be burned. I would not trust fumigation to render a feather bed safe, on which a patient had slept.

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#### ASSOCIATED HEALTH AUTHORITIES OF PENNSYLVANIA. THIRD ANNUAL MEETING.

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The third annual meeting of the Associated Health Authorities of Pennsylvania was held in the Senate Chamber, Harrisburg, Thursday and Friday, January 23 and 24, 1896.

The meeting was called to order at 10 A. M. Thursday, January 23, by Mr. Crosby Gray, Superintendent of the Bureau of Health of Pittsburgh, the second vice president.

Prayer was offered by the Rev. B. B. Hamlin, D. D., of Harrisburg.

The Secretary then presented a communication from his honor, the Mayor of Harrisburg, expressing his regret at not being able to be present at the meeting, and requesting that Dr. Lee should introduce Dr. Hugh Hamilton to welcome the guests to the city.

Dr. Benjamin Lee then addressed the meeting as follows:

"Mr. President and Gentlemen: As his honor, the mayor, has requested me to introduce Dr. Hugh Hamilton, of Harrisburg, I would say to you, those who do not know him, that he is one of those physicians who does not confine his efforts to curing his patients who call upon him for his services, but also extends them to the public, and at the previous convention of the Associated Health Authorities of Pennsylvania, held under the auspices of the State Board of Health, he was present with us, and made some valuable contributions."

Dr. Hugh Hamilton's address of welcome:

The mayor of Harrisburg has deputized me to welcome you to the capital city of the Commonwealth of Pennsylvania. Therefore, in his name I do now extend to you a hearty invitation to inspect



our streets and other municipal improvements, drawing your attention to the fact that for its size (over 50,000) and its relatively large floating population, the death rate is among the very lowest within the boundaries of the State.

"Typhoid fever is very, very rare. There are the paludal fevers, but none of severe type. We dealt successfully with a recent epidemic of small-pox by the use of practical and energetic methods, namely, vaccination and isolation. In diphtheria our progressive physicians have resorted to the most approved antitoxic treatment, decidedly reducing the death rate from this cause.

"Very likely the malarial fevers prevailing in valleys like the Susquehanna river keep one on the alert, so that our lives are stirred up frequently, thereby averting more fatal maladies. This is probably one source of the low mortality. As to our morbidity, it is in striking contrast with many other places in the Keystone State, because we enjoy the rich products that these fertile silurian valleys bestow—and we did delight in the purest water that ever fell from heaven. The past tense is used because we look to you for measures of relief from this condemned culm-laden water, through suggested legislation. It is the duty of this convention to do something toward this being stopped. It is unjust that the prior vested rights of towns should be invaded to gratify the coal industry. That culm water is healthy, I most positively deny. That if not healthy, it must be unhealthy; hence, needs to be eliminated from our food supply.

"Should the towns and cities that existed before the coal industry be compelled to pay for this vile contamination by endeavors to purify it? The voice of common sense says: No. And this convention can say no in chorus. It is evident that something must be done. We look to the Board of Health for health. Their highest office is the prevention of disease.

"Prevention of disease! That is the cry of civilization and the watchword of the future. A doctor of medicine, if given authority, is culpable for the spread of preventable disease. Small-pox is annihilated by persistent vaccination. Typhoid fever is preventable by pure water and food supply. Diphtheria is prevented by isolation and antiseptics. The cholera was restrained in its progress westward by the ratio of its intelligent prevention. Pennsylvania legally strives to prevent the blindness of infants by immediate treatment at birth. When diseases are preventable they may become totally eradicated. Think of the possibilities of wiping out 'epilepsy, consumption and the burning ague' (Leviticus xxvi, 16).

"The first step was taken in sanitation when Louis Pasteur found that organized ferments had the quality of discriminating between

physical compounds of identical composition. Pasteur, whose long life was devoted to research, and whose body was given a national burial, and whose work received the eulogium of a grateful universe,

"Briefly, you have been shown what our capital city has; we hope you will observe them and seek other facts yourselves and further, that the result of your deliberations may be for the best possible hygienic welfare. Again, in the names of the Hon. Maurice C. Eby, the mayor, for the corporation and citizens of Harrisburg, Pennsylvania, you are bidden a very cordial welcome."

The Chairman, Mr. Crosby Gray, then addressed the meeting as follows:

"Gentlemen of the Association: The next number on the program is opening remarks by the first vice president. Thanks to your partiality of a year ago, I have the honor, accidentally as it were, of presiding over your deliberations this morning. I have regrets, however, to mention. First, the absence of the honored president of this association, the Governor of this Commonwealth; second, the absence of the first vice president, Major Moses Veale, of Philadelphia; third the absence of the third vice president, Dr. Allen, of Scranton. On account of the unavoidable absence of these gentlemen, it has devolved upon me to preside over you for the present at least. I have another regret, and that is, that the attendance this morning is not what it should have been. There is no subject or question in which the people of this Commonwealth and the health authorities who look after their several welfares, are so much interested as their health, and yet we know and regret that so many of them do not appreciate the fact; and it was hoped that the health authorities of the different cities and boroughs of this Commonwealth would have been fully represented on this occasion, and we trust and hope that, before the close of the session many more will be represented. But what this association lacks in quantity is fully made up in quality. I shall have to ask your indulgence as your presiding officer; I may make mistakes, doubtless I will. If I do, I desire to beg your pardon in advance, and more than that, place the responsibility of those mistakes upon yourselves on account of you having lifted me to this position. To you, Dr. Hamilton, who have so kindly and ably welcomed this association on behalf of its chief magistrate of this city, we accept your welcome, and trust that our deliberations may be of some benefit to you as well as to the other portions of the State which we have the honor to represent. I trust that before the day passes, Vice President Veale will be present, and I have no doubt that he will have something of interest to read to your association."

The secretary then presented a communication from Dr. Leon-

ard Pearson, announcing his inability to be present and asking permission to be enrolled as an "honorary" member of the association.

On motion made by the secretary, he was declared an honorary member.

Dr. Robert L. Pitfield, assistant bacteriologist to the State Board of Health, Philadelphia, read a paper on "The Etiology and Diagnosis of Diphtheria."

The "Advantages of Bacteriological Investigations to Boards of Health," by B. Meade Bolton, M. D., bacteriologist to the board of health of Philadelphia being next in order, the secretary stated Dr. Bolton was unable to be present, but that he had sent his paper and boxes, together with circulars made use of by him in his investigations, and some of the rules and regulations governing the division of pathology in the laboratory of hygiene, bureau of health. The paper was then read by the secretary, after which the president announced discussion to be in order.

The paper was discussed by Dr. Benj. Lee, M. G. Lippert, Dr. H. H. Whitcomb, Mr. Jos. McFarland, Mr. Mays and Dr. Jos. McFarland.

Further discussion was dispensed with in order that the next paper might be taken up.

"The Relation of Slaughter Houses and Similar Offensive Industries to the Spread of Diphtheria," by A. H. Halberstadt, M. D., president of the board of health of Pottsville.

A. H. Halberstadt, M. D., Pottsville: "Mr. President, Ladies and Gentlemen: When I was written to on this subject, I felt that I was compelled to decline for the reason that I am not a bacteriologist, and I did not consider that I was capable of writing a paper of such a character. I rise now to offer a resolution.

"On the outskirts of the town in which I live, we have a pork-packing establishment. The material in connection with this establishment is not allowed to go to waste, but every particle of it is made into something of commercial value. The processes they adopt, as in bone boiling, make the neighborhood almost impossible to live in, although persons living in the locality have developed no such disease as diphtheria, it has resulted in a frightful mortality in the borough. We know that in the manufacture of these processes they use articles like sulphuric acid which would be a germicide, and it is impossible for us to determine whether there is a relation or not, except that in our community people are compelled to inhale those gases or vapors of those stinking emanations that takes one's appetite and compels the shutting up of houses in order to avoid the unwholesome smell. We think there must be some relation to disease prevalence. It was very important to secure testimony before we arraigned this packer, for he paid no attention to notices, so we in-

sisted upon those most interested getting up a petition against the pork-packer. They presented this to the board of health, which we submitted to our counsel. The nuisance was abated and the epidemic declined, but it was not long before cold weather came when people are shut up in their houses. The same nuisance exists to-day. Counsel, for money can create delay, did wear out the prosecutors until cold weather comes again, when the people are not subjected to the same nuisance.

"Some of the people in this neighborhood have had to leave their houses owing to the nuisance.

"There cannot be any doubt but what living in an atmosphere of that kind must enervate the condition of those people and render them more susceptible to any disease, not particularly diphtheria, but scarlet fever and all diseases of that class. I would, therefore, offer the following resolution:

"Resolved, That a committee be appointed to investigate the sanitary relation of emanations from slaughter houses, pork-packing establishments and similar industries to the creation and spread of diphtheria, scarlet fever and diseases of that class on a bacteriological basis."

On motion the resolution was adopted.

The next paper in order was "The Diphtheria Antitoxic Serum," by Joseph McFarland, M. D., lecturer on bacteriology, Medical Department of University of Pennsylvania, Philadelphia.

Discussions followed by Jesse C. Green, D. D. S., West Chester; H. H. Whitcomb, M. D., Norristown; C. W. Perkins, M. D., Chester; Robert L. Pitfield, M. D., Philadelphia; M. G. Lippert, C. E., Phoenixville; Maj. J. A. McLaughlin, Allegheny; S. C. Spaulding, M. D., Shenandoah.

On motion the meeting then adjourned to meet at 2.30 P. M. in the Supreme Court room.

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The meeting was called to order at 2.30 P. M. in the Supreme Court room, Mr. Crosby Gray, presiding.

The first business in order being the discussion of the papers by Drs. A. H. Halberstadt and Joseph McFarland.

Dr. Pitfield introduced the following resolution:

"Resolved, That this Association of Health Authorities of Pennsylvania recommends the antitoxin of diphtheria as a valuable agent in the prevention of the spread of diphtheria."

The secretary then offered the following amendment to the resolution offered by Dr. Pitfield:

"Resolved, That we respectfully request the Medical Society of the State of Pennsylvania to appoint a committee to report upon the value of antitoxin as a preventative of diphtheria."

Dr. H. V. Logan, Scranton: "I second Dr. Atkinson's amendment and in doing so, would simply state that we, in order to make the investigation thoroughly would have to go to considerable expense."

There being a division, the ayes were thirty-seven against ten nays. The resolution as amended was then adopted.

The Chair then addressed the association on the paper of Dr. McFarland.

The report of the executive committee being next in order, the chairman, Dr. Lee, presented his report, which was received and filed.

Report of the committee on publication, Moritz G. Lippert, C. E., chairman, was then presented and received and ordered to be filed.

Report of the committee on legislation was presented by Captain C. P. Weaver, in behalf of A. M. Beitler, Esq., chairman. It was received and ordered on file.

The report of the special committee on teaching hygiene in public schools was then in order, and Dr. George G. Groff, the chairman of that committee, made his report:

Dr. H. H. Whitcomb, Norristown: "This report has largely been gotten up through the earnest efforts of the chairman, and it seems to be wise to continue him in this good work looking after these books, and I move that the report be received and the chairman be continued in the work."

Dr. Benjamin Lee, Philadelphia: "I desire to amend Dr. Whitcomb's motion, to make it read 'that the committee be continued,' instead of the chairman. The subject is an important one, and I think the entire committee should be put in."

The report was accepted and ordered to be published, and the committee continued.

Report of the special committee on preparing a code of health laws, Crosby Gray, Esq., superintendent bureau of health, Pittsburgh, chairman.

The report of the special committee on preparing a code of health laws being next in order, Dr. Lee took the chair, and the chairman reported that on account of a misunderstanding there had been no conference during the past year of that committee.

On motion it was ordered that the committee on codification of the health laws of the State be continued with Mr. Crosby Gray as chairman, with instructions to add as many others as necessary.

On motion of Dr. Lee it was

Resolved, That the Associated Health Authorities of Pennsylvania endorse the movement on the part of the State Board of Agriculture and the Forestry Commissioner towards setting apart reser-



vations in this State for the protection of forests as a means for securing a purer water supply.

Dr. Lee: "It has been wisely said by a Western sanitarian that what we want in our drinking water is 'innocence' and not 'repentance.' Filtration is good, but how much better it would be to have water that needed no filtration. There is no question that setting apart large areas of forest lands will be a great step toward the securing of a pure water supply."

Dr. Robert S. Maison, of Chester, then offered the following resolution:

Resolved, That a committee of three be appointed to consider the relations between the County Health Associations and the Associated Health Authorities of Pennsylvania, to report at the next meeting.

The resolution was, on motion, adopted, and the following committee appointed:

R. S. Maison, M. D., chairman; Benjamin Lee, M. D., Moritz G. Lippert, C. E.

Dr. Groff presented his report on sanitary legislation, which was received and filed and the association adjourned until evening.

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#### Evening Session.

Prof. Francis C. Phillips, of Allegheny, read a paper on the "Protection of Water Supplies."

Paper discussed by Drs. Lee, Maison, Mr. Leighner, Lippert and others.

E. S. Wagoner, Mechanicsburg, then offered the following resolution:

"Resolved, That in the matter of water ways this matter be referred to the legislative committee, with full power and authority to investigate and if necessary report at the next meeting of this association."

Dr. Lee: "If that committee is to accomplish anything with the next legislature, Mr. Chairman, it occurs to me that it will be a little late for it to report at the next meeting of the association. Such a bill ought to be introduced the moment the legislature meets, and I would, therefore, amend the resolution by instructing the committee to prepare and present the bill without reference to the association." The amendment was accepted and the resolution adopted.

The meeting then, on motion, adjourned to meet Friday morning at 10 A. M.

Friday, A. M.

The meeting was again called to order at 10 A. M., Friday, January 24, 1896, Mr. Crosby Gray presiding.

A communication was presented by the secretary announcing the inability of Dr. Pemberton Dudley, of Philadelphia, president of the State Board of Health to be present.

The first business of the day was the paper by Dr. Benjamin Lee on the law of 1895, for the restriction of contagious diseases. Dr. Lee addressed the meeting as follows:

Mr. President and Gentlemen: Probably the most important legislation that has been accomplished in this State for the protection of the public health, after the establishment of boards of health in cities and boroughs, has been the act passed on June 18, 1895, for the better protection of the public health, which was in effect establishing a complete code for the State of Pennsylvania, for the restriction of contagious diseases. It affects not only cities and boroughs as incorporated municipalities, but it affects also townships, because we have had decisions both previous to and since the passage in that act that a township is a municipality. It is incorporated, and, therefore, as this act by its title refers to the municipalities of this Commonwealth, it is considered to refer to rural districts as well as to cities and boroughs.

"Heretofore, in this State, there has been an entire lack of uniformity in the regulations of different cities and towns in this important matter. Each borough has adopted its own ordinances with regard to quarantining, disinfecting and every other point in connection with the management and restriction of contagion; but from and since the passage of this law that has been changed, and every city and borough in the State will have exactly the same ordinance on these subjects. It does not matter at all what councils say in regard to this. They may adopt any ordinances that they please, but if those ordinances are not in strict conformity with this law they are null and void. It may be said, however, that boards of health are authorized by this law to make more stringent regulations than those in the law with regard to diseases specified in section four of the act. Thus, the very annoying dependence of boards of health on councils for carrying out their regulations with regard to the restriction of contagion no longer exists. Boards of health in this respect now occupy the position they ought to in all respects, as independent departments of the city or borough government.

"I trust that the time will come when the board of health will stand in this relation, and that it will not be in any way dependent on the councils, either for its support or for an endorsement of its regulations. This is certainly a very important step in that direc-

tion. In section nineteen of the act we find a general grant of power. This section reads:

"The health authorities of the several municipalities of this Commonwealth shall, and they are hereby authorized and empowered to establish rules and regulations regarding the isolation of persons who may be suffering from any of the diseases mentioned in section four of this act, and for the destruction, disinfection and fumigation of bedding, clothing or other infected articles, and for the disinfection and fumigation of houses and premises, and for the carrying out of the provisions of this act, as they may in good faith declare the public safety and health demand, which rules and regulations they may from time to time alter or amend."

"It is difficult to conceive of a more complete grant of power than this section conveys, and you will observe that nowhere in that section or anywhere in this act, is there any reference whatever to endorsement by the councils. This act is obligatory and mandatory in every respect except one; boards of health are not only authorized to enforce its provisions but they are commanded to; and the suggestion of the State Board of Health would be that each local board shall adopt regulations which shall in every respect repeat and conform to the words of this law. The State Board of Health has taken pains to bring itself in harmony with the law by adopting a regulation which enables the State Board to enforce its provisions all through the State in the rural districts, and I can conceive of no better plan for the local boards than to adopt this law in full as their regulations, and in any instance where deemed advisable, as the law authorizes, to add to the regulations herein such as they deem necessary for the protection of the public health.

"The only matter which is left optional to local boards is whether they shall or shall not placard houses in which contagious diseases exist. This was left optional principally in deference to the request of the board of health of Philadelphia, which in many instances has preferred to establish guards over houses rather than to placard, although I may say as a matter of information that during the last year the board of health of Philadelphia, influenced, I have no doubt by the fact that boards of health of smaller cities were so generally adopting the precaution of placarding, has in a number of instances followed the same plan.

"Another plan has been adopted by many local boards, that of hanging out a flag instead of using placards. The State Board of Health considers that is a decidedly inferior line of precaution. It is true that people after while will learn what the color of a certain flag means, but if the moment a person is about to enter a house he is confronted with a statement in big black letters 'smallpox in this house,' it really has rather a different impression than that of a



flag. We conceive, therefore, that the placard is a much more efficient form of protection, and we strongly recommend it to every local board. There is a great objection made to placarding by many persons that it may create a panic, and the same objection is made to the declaration of the fact that a disease is epidemic in a town or city. This, I have no doubt, has its origin from purely commercial consideration. Those who are afraid of a panic are those who are afraid that their business will be injured. They are those who do not look upon the matter from any other than pecuniary grounds, and on that question I do not think their objection should be respected.

"I, myself, however, believe that the idea is altogether a mistaken one, and that a panic is to be avoided not by allowing the newspapers to publish whatever they please about conditions which may prevail, but by furnishing the papers exact facts; stating exactly how many cases of any infectious disease exist in any city, where they exist and exactly what precautions are being taken by local authorities. With such statements before them the people feel that their interests are in good and safe hands, and do not allow themselves to get into a panic. The theory which has been so largely promulgated, that the infection is promoted by panic and that people die because they are frightened has no better origin or basis than an old Asiatic fable, which you have all doubtless read, in which the Angel of Death is represented as making his appearance to a sage, and the sage attacks him because he has infected the place with pestilence. The Angel of Death makes reply that he is not the responsible party, and introduces another terrible figure under the guise and name of Panic, and states that he is the individual who is causing the deaths.

"Now, I venture to say, if you take ten men, five of whom have been vaccinated and five who have not been vaccinated, but who say they are not afraid of smallpox, and subject all those men to the same risk of taking smallpox, the five who have been vaccinated will be those who escape, and the five unvaccinated will be the ones who take smallpox, no matter how stoutly they may declare that they are not afraid of it.

"Boards of health need never be afraid that any action which they take will create a panic.

"I beg all boards to remember that this law imposes duties upon them as well as upon the community, on physicians and other responsible persons. The regulation which directly refers to parties being held responsible is section twenty-one, which reads as follows:

"Any physician, undertaker, principal of a school, superintendent of a Sunday-school, sexton, janitor, head of a family or any other person or persons named in this act who shall fail, neglect or

refuse to comply with or who shall violate any of the provisions or requirements of this act, shall, for every such offense, upon conviction thereof before any mayor, burgess, alderman, police magistrate or justice of the peace of the municipality in which said offense was committed, be liable to a fine or penalty therefor of not less than five dollars or more than one hundred dollars, which said fines or penalties shall be paid into the treasury of said municipality, and in default of payment thereof, such person or persons so convicted shall undergo an imprisonment in the jail of the proper county for a period not exceeding sixty days.'

"Although I would call attention to the fact that in many of the sections there is a statement at the end of the section that certain parties are responsible for the enforcement of the regulation, as for instance in section nine, with regard to burials: 'The undertaker and the person or persons having charge of the premises shall be responsible for any violation of the provisions of this section;' I beg boards of health to remember that they are 'named in this act,' and that the duties which it imposes are incumbent upon them, and it is important to give it careful study in order that they may not become amenable to penalty under its provisions. Under those provisions it becomes necessary for them to furnish blanks in certain cases. Other laws which have been passed, as that establishing a State Board of Undertakers, and that providing for the registration of plumbers, also making it necessary for local boards of health to furnish blanks for registration of the parties therein named.

"The State Board of Health is about issuing a circular in connection with which there will be forms which local boards at their pleasure may adopt.

"Certain officers, justices of the peace especially, are forbidden to serve on boards of health. The question has often been put whether this includes members of school boards. The State Board has obtained legal advice to the effect that members of school boards are eligible to positions on local boards of health.

"I do not know that there are any other points in this law which it is especially necessary to call attention to at the present time, but if there are any points which suggest themselves on which I can throw any light, I shall be very happy to do so."

Mr. Gallagher, Allentown, asked if a physician located or practicing in any municipalities of this Commonwealth could be compelled to report a case that he might have in suburbs of that municipality.

Dr. Lee replied "that he did not think that a physician could be compelled by the board of health of the borough to report a case existing outside of the limits of the borough. The duty of that physician would be, if the State Board of Health had a representa-

tive in that township, to report to him. Otherwise, his duty would be to report directly to the State Board of Health, but the local authority could not compel him to report to it."

Dr. Logan, Scranton, then asked what would be the duty of the authority could not compel him to report to it."

Dr. Lee replied as follows: "This brings up a matter which may, perhaps, not be generally understood, which is that, in default of any provision by the legislature for local authorities outside of incorporated boroughs and cities, the expedient has been adopted of appointing 'deputy inspectors to the State Board of Health.' These have been appointed for one, two, three or more townships as the case may be, usually directly contiguous to an incorporated borough, and these inspectors are authorized to placard, quarantine and disinfect in the name of the State Board of Health. Their instructions are to go ahead and do what is necessary, and then report. The great obstacles, however, to efficient service of that kind is that there is no provision for meeting the expenses of such action. There is no provision for providing for the wants of those who are in quarantine. There is no provision for the purchase of disinfectants or for the employment of guards. Consequently it must be confessed that it is to a certain extent a paper quarantine. In such instances the State Board of Health is fully convinced that it is not only within the province of the poor directors and county commissioners, but it is their duty to enforce quarantine, and provide for persons thus unfortunately cut off. In several cases this they have positively refused to do.

"I have recently received a communication from one of the county inspectors who states this matter at length as well as the great difficulties which he has met with in attempting to carry out his duties, and I think Dr. Maison, of Chester, county medical inspector for Delaware county, will be kind enough to give us his experience in this respect."

Vice President W. E. Allen, M. D., was called to the platform.

Dr. Robert S. Maison, of Chester, in response read a paper on "The Necessity of an Increased Appropriation to the State Board of Health," sufficient to enable it to quarantine and disinfect contagious diseases in places having no health authorities, by employing guards and furnishing disinfectants, etc., when necessary, and called attention to the difficulty experienced by him in quarantining and providing for diphtheria patients near Media during the past summer, where the poor directors refused to do anything towards their support or to employ necessary guards. He then presented the following resolution.

Resolved, That the committee on legislation be instructed to

confer with the boards of health of this State, asking them to use their influence to induce the legislature to increase the annual appropriation to the State Board of Health, and to prepare and present a bill to this effect at the next session of the legislature.

Mr. James H. Harlow then amended the resolution by adding "to increase the powers of the State Board of Health."

The resolution was then read as follows:

**Resolved,** That the committee on legislation be instructed to confer with the boards of health of this State, asking them to use their influence to induce the legislature to increase the annual appropriation to and the powers of the State Board of Health, and to prepare and present a bill to this effect at the next legislature.

The question then being asked as to the "five mile limit of boards of health," Dr. Lee replied as follows:

"This question is one that has often been suggested. I do not think that any such power exists in a local board of health, as that its jurisdiction extends five miles beyond its borough limits. The act establishing boards of health in cities of the third class does authorize those boards in cases of severe epidemics to establish quarantine five miles outside of their city limits. That, I think, is only intended in cases where there is an epidemic in a neighboring city at a distance; an epidemic alarming in its proportions, as for instance Asiatic cholera or a serious epidemic of smallpox. In such cases, any city of the third class can establish a line of quarantine five miles outside of its own limits, but that does not give that board authority to establish domiciliary quarantine whenever it pleases outside of its own limits.

"That provision has been carelessly interpreted by many borough boards of health, who appear to think that it refers to borough boards as well as boards in cities of the third class, and also think that it includes the right to abate nuisances as well as to enforce quarantine. They therefore say, that anywhere within five miles of their limits they can go and shut up slaughter houses and soap factories, and perform any duty of that kind. That is an entire misapprehension, and any board which attempts to perform such work may get itself into trouble.

"The most effective means to prevent the introduction of contagious diseases from neighboring villages would be to notify the residents of the infected locality, that any of them appearing within the limits of the borough would be immediately arrested. Let this notice be published in the papers, and also let it be posted by local authorities. In this way the information will be quickly disseminated, and the people of the locality will know that the moment they enter the city they are under arrest, and you will effect just as much as though you placed armed guards at the gates of your city."

Mr. Jas. F. Gallagher then offered the following resolution, which was on motion adopted.

Resolved, That the State Board of Health be requested to appoint its deputy inspectors in accordance with the wish of the local boards.

Mr. M. G. Lippert then presented a communication which had been addressed to him by the president of the Association of School Directors of the State of Pennsylvania (H. H. Quimby) with regard to the construction of school houses and their hygienic management, and moved that the letter be referred to the State Board of Health with the request that that body should comply with the suggestions contained therein.

Dr. Lee, Philadelphia: "I desire to state in this connection that the State Board of Health already issues circulars with regard to the construction of school houses and their hygienic management. It has two circulars on this subject, one addressed to school directors and one addressed to school teachers. It has in mind the revision of both of these circulars at an early date, and it will be very glad to have this matter referred in order to make it a basis of further action. I take great pleasure in saying that the Superintendent of Public Instruction, the Reverend Dr. Nathan C. Schaeffer, is also in harmony with the State Board of Health in this matter, and in many instances he has aided us in the distribution of the circulars referred to."

On motion of Moritz G. Lippert, C. E., it was then

Resolved, That the letter from Mr. H. H. Quimby, president of the Pennsylvania School Directors' Association, be referred to the State Board of Health of Pennsylvania with the request that that body comply with suggestions as contained therein.

The question of abating nuisances caused by disposing of garbage at Morrellville, dumping it into streams and thus polluting the water supply was then brought up, to which Dr. Lee made the following reply:

"In the absence of any law to protect streams in this State, the nuisance complained of can only be proceeded against under the general law of nuisances. That is also the case with regard to nuisances existing outside of the borough limits.

The next paper in order was "The Production, Transit, Etc., of Milk," by E. O. Shakespeare, of Philadelphia, read by Dr. Atkinson. This was discussed by Mr. Lippert and others.

On motion, it was then

Resolved, That a bill be prepared by the legislative committee and presented by that committee at the next session of the Legislature, providing for pure milk.

New business being in order, the report of the special committee appointed to consider the relations between the county health as-

sociations and this association, with Dr. R. S. Maison as chairman, was received.

On motion of J. G. Shoemaker, M. D., of Phoenixville, it was

Resolved, That the associated health authorities of Pennsylvania shall meet annually at the call of the executive committee and the place of meeting shall be the capital of the State in the years when the Legislature is in session, and in intervening years the meetings may be held elsewhere as the executive committee shall direct.

M. G. Lippert, C. E., Phoenixville, then offered the following amendment to the by-laws in regard to associate members, which was on motion adopted.

Associate Members.—“Associate members may be those formerly members of boards or bureaus of health, whether represented or not in this association or those now members of such bodies, not represented in this association; or those having any official connection with State or local health authorities without being members of the same. Their annual dues shall be one dollar, and they shall be entitled to participate in the discussions at the meetings of the association, and to receive copies of the printed proceedings and of all other publications of this association, but they shall not be entitled to vote.”

Dr. Jesse C. Green then presented his report as treasurer of the association, which was as follows:

#### Treasurer's Report.

Jesse C. Green, as treasurer of the Associated Health Authorities of Pennsylvania, submits the following report ending January 24, 1896:

To cash received from boards of health. ....	\$241 57
To cash received from associate members. ....	4 00
	<hr/> \$245 57 <hr/>
By cash paid for stationery, printing and postage. ....	\$177 83
By cash paid janitor of Supreme Court room, ....	13 25
By cash paid chairman legislative committee, expenses at Philadelphia meeting, .....	10 00
	<hr/> \$201 08 <hr/>
Balance in treasurer's hands. ....	\$44 49

Dr. Benjamin Lee, chairman of the executive committee, acting as an auditing committee, reported this as correct.

On motion, the reports of the treasurer and auditing committee were received and ordered to be filed.

Mr. D. Rhine Hertz, of Ephrata, then moved that a committee of three be appointed, to which questions could be referred by local boards.

The motion was carried, and the chair appointed the following committee:

Benjamin Lee, M. D., Philadelphia, chairman; Major Moses Veale, Philadelphia; A. M. Beitler, Esq., Philadelphia.

The annual election of officers being now in order, nominations were made and the following persons were elected:

President—His Excellency, Daniel H. Hastings, Governor of Pennsylvania, *ex-officio*.

First vice president—Crosby Gray, Pittsburgh.

Second vice president—J. S. Hunt, M. D., Easton.

Third vice president—A. M. Sloan, Esq., Greensburg.

Secretary—Wm. B. Atkinson, M. D., Philadelphia, 1400 Pine street.

Treasurer—Jesse C. Green, D. D. S., West Chester.

The chairman then announced the following standing committees for the ensuing year:

Executive.—Benjamin Lee, M. D., Philadelphia; C. P. Weaver, Norristown; J. G. Shoemaker, M. D., Phoenixville; A. H. Halberstadt, M. D., Pottsville; Major J. A. McLaughlin, Allegheny.

Publication.—M. G. Lippert, C. E., Phoenixville; W. H. Ford, M. D., Philadelphia; James H. Harlow, C. E., Edgewood; Wm. B. Atkinson, M. D., Philadelphia; Benjamin Lee, M. D., Philadelphia.

Legislative.—A. M. Beitler, Esq., Philadelphia; Major Moses Veale, Philadelphia; C. S. Martin, M. D., Allentown; A. M. Sloan, Greensburg; A. H. Strickler, M. D., Waynesboro.

Committee on Relation of Slaughter Houses and other Offensive Industries to the Spread of Diphtheria.—A. H. Halberstadt, M. D., Pottsville; H. H. Whitcomb, M. D., Norristown; Robert S. Maison, M. D., Chester; Jos. F. McFarland, Esq., Washington; J. M. Leighner, Esq., Butler.

On motion, it was ordered that the legislative committee prepare and present to the next session of the Legislature for enactment, an amendment to the act of May 11, 1893, establishing boards of health in boroughs, providing for the appointment and support of such boards of health in such a manner as to make them independent from the councils.

Mr. Crosby Gray, chairman: "I beg to say that the meeting of the association on this occasion, while not as large as was hoped for, has been an exceedingly interesting one to me at least, and I hope and believe that it has been productive of much good. Let us go home, gentlemen, with a high resolve, let others do what they may,

we will endeavor to the best of our ability to serve the public in the capacity in which we have been placed, and return at the meeting next year able to report that good work has been done.

"Personally, I desire to thank you one and all for the courtesy which has been extended to the chair during these sessions to one totally unprepared for exercising the duties. I desire to thank you for your appreciation of myself in having your unanimous support for the position of first vice president.

"I desire to bid you all farewell, and hope to see not only all present to-day, but very many more as well, one year from now. If there be no further business, the session will close."

On motion, the meeting then adjourned sine die.

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## THE BACTERIOLOGICAL STUDY OF THE ETIOLOGY AND DIAGNOSIS OF DIPHTHERIA.

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By Robert L. Pitfield, M. D., Assistant Bacteriologist State Board of  
Health of Pennsylvania.

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The last fifteen years in the annals of medicine have been exceedingly interesting, and much has been learned whereby the cause of humanity has been furthered in its ceaseless struggle with disease.

The period is interesting to us because early in it began the real and scientific study of diphtheria, since in 1883 Klebs first described the bacillus of diphtheria and a year later Löffler confirmed the description by isolating it and inducing with the bacillus the same disease in lower animals.

And further the history of this study has been remarkable, not only from the scientific data obtained, but from the fact of its completeness; during that time, not only the cause or etiology has been made known, but good working methods of absolute diagnosis have been developed, and lastly a real, specific cure has been discovered, tried and found to be good—namely, the antitoxin method of treatment of which the limitations of this paper permit but little more than mere mention.

With the announcements by Roux and Behring that the diphtheria antitoxin made coincidentally by them is a true specific for this disease, and the continued confirmation of their statements by



men who have tried this method, there is rounding out the completion of one of the most interesting and valuable chapters in the science of medicine. And not only has science been enriched but humanity as well, and this discovery has infinitely more import for happiness and general welfare to countless families than the discovery of new worlds or other elements in this atmosphere of ours.

Medical men may view with pride this last quarter century, since in that time medicine has advanced to larger spheres than has almost any other branch of science. Chemistry to-day is on the verge of a revolution, but medicine sits more firmly enthroned on her foundations.

Much has been done to render lighter human suffering and the methods of diagnosing diphtheria and its treatment rank next to the method of antiseptic treatment of wounds which is the greatest boon humanity has known in years.

I shall dwell at first on the technique of diagnosing diphtheria since this will give you an insight into the cause of the disease, the bacillus, which intimately concerns the etiology. This organism is a slender little rod, varying greatly in size, shape and internal structure, and because of the variability we are able at once almost to recognize it.

It is often club-shaped, with rounded ends, and with a slender middle; again, it is spindle-shaped with pointed ends. The shape and general morphology vary greatly with age and conditions of growth, such as the chemical reaction of its food. It grows on solid media, in little greyish colonies, which are rounded, with irregular edges and are like ground glass, in that they do not reflect the light.

If it is stained with an aniline dye, various parts of the organism take up the color with varying intensity, parts being stained very deeply, others hardly at all; this gives a very characteristic appearance to the bacillus. Often if a blue dye is used, black points appear in its continuity which do not transmit light. The bacillus has not power to move independently, nor does it form spores. It grows best at the temperature of the body and exposure to heat above 58°C. kills it in a very short time. It has never been found "wild"—that is, it is a strict parasite and differs from some other pathogenic bacteria in this way. Cholera, for instance, exists normally in certain waters, all the year round, as a native.

The native home of the bacillus is the human mucus membranes, especially those of the throat from which it may escape by coughing, by saliva, by contact with spoons, forks, cups, handkerchiefs, or by kissing. Besides living in the human throat, the air passage of chickens, kittens and other birds and animals, may contain the bacilli, inducing in them a true diphtheria, which often causes death.

It is rarely found in the air and thrives best in moist places, especially if warm and dark, as is the human throat.

It readily grows upon a culture medium devised by Löffler, and for diagnostic purposes this is the best. It is called the Löffler blood serum mixture.

This is prepared by collecting the blood from an ox in a clean sterile jar, which has been slightly warmed, and after the clot has formed, the fluid part or serum is drawn off in sterile pipettes.

This serum is then mixed with bouillon in the proportion of one part bouillon to three of serum; the former containing 1 per cent. of glucose. After this has been done, a little of the mixture is run into sterile test tubes which are plugged with cotton wool, then they are placed in a hot chamber at a temperature of 78°C., in such a way as to slope the surface of the serum and make a large surface, oblique to the sides of the tube.

These tubes are kept in the serum apparatus for an hour or more, until the serum is coagulated into a firm translucent jelly, then they are sterilized for three consecutive days in a sterilizer for twenty minutes each day in order to kill off all stray bacteria, which may have gotten in the media or tubes.

To make a diagnosis of diphtheria a sterile swab which has been kept in a sterile test tube is firmly and freely rubbed over the membrane in the throat and this gently rubbed over the moist surface of the serum. And then the tube is carefully replugged with the cotton and put in an incubator and kept at the temperature of the body 37°C. for twelve or more hours. At the end of this time, if the case be diphtheria, over the surface of the serum will have crept a fine delicate frosting consisting of raised beads, huddled close together, these are of a greyish color, semitranslucent and are heaps of diphtheria bacilli which have grown on the serum.

With a delicate flattened piece of platinum wire, well flamed, a few of these frosted heaps are lifted off the serum, and gently rubbed on the surface of a clean cover slip, on which a drop of water has been deposited. And then after thoroughly drying and fixing this film on the slip, it is stained with an alkaline solution of methyl blue. After mounting and the lens brought to bear on it, the field will be found full of delicate little rods lying in all directions, often in clumps of a dozen, or singly.

By careful study the organism is seen to vary greatly in size and general appearance, but as I have said before this difference in morphology is really of great service to the bacteriologist in identifying it. This and the fact that the organism takes the stain in varying intensities throughout its protoplasm, enables one to make the diagnosis; especially if the culture to the naked eye appears normal. The diagnosis is best performed if the swab is rubbed over the

membrane before any antiseptics have been used in the throat since these greatly hinder the growth, often delaying it, or rendering it very uncertain.

We are likely in this examination to find many other organisms such as yeast, moulds, and many other bacteria, especially the *staphylococcus aureus* and *albus*, which often cause abscesses and other inflammations, and another called the *streptococcus pyogenes* which strongly imitates the diphtheria bacillus, not only in producing a membrane, but in its cultural appearance on blood serum, it produces the same frosting, only a little whiter, but under the microscope it is seen to consist of a chain of little rounded bodies called cocci; these are in some way held together, and there often is a string of from 8-16. This organism is also the cause of many inflammatory diseases as erysipelas, puerperal fever, septicaemia, and is supposed to be the cause of scarlet fever. Many apparently simple sore throats both with and without a membrane are caused by it.

As the bacillus of diphtheria develops in the throat, it produces a poisonous alkaloid or toxin, which penetrates the cells of the mucous membrane and the protoplasm of these it coagulates, causing them to swell up and turn white as they die. This is the origin of the yellowish, dirty white membrane, from which the disease takes its name. This membrane is full of all sorts of organisms, very largely the diphtheria bacillus. Often the membrane mechanically interferes with breathing, especially if it grows in the larynx and very frequently in young children and even adults causes death by suffocation. The poison unfortunately penetrates not only the mucous membranes, but the tonsils, the lymphatic glands of the neck and finally the whole system, causing fever, depression with rapid pulse and as it advances produces often paralysis of important nerves, not only of the limbs, but of the circulating apparatus and the diaphragm; the heart is often overwhelmed by the poison, and death in this way results from acute poisoning or toxæmia. If the toxin is collected from old cultures, by filtering off the germs, it will produce the same effects if given in large enough doses by injection to small animals; four drops will kill a guinea pig in 24-48 hours and yet no germs were injected.

The worst cases of this toxæmia are those in which there is a mixture of the diphtheria bacilli and the streptococci of which I spoke. The toxins of both are absorbed and the patient often succumbs to a double poisoning.

Serum tubes in a large bacteriological laboratory often show besides the pure cultures of diphtheria and streptococcus, a mixture of both.

By means of these tubes we are enabled to say if a case is diphtheria alone or a mixed infection. Many epidemics of simple sore

throat are caused by this streptococcus, often they resemble diphtheria by having a membrane.

The diagnosis of diphtheria by cultural means is of great importance in those cases where the precious remedy antitoxin can be employed, there are many cases of sore throat simulating diphtheria which are really but simple, follicular tonsillitis in which employment of antitoxin is useless. A physician can then record a real cure by antitoxin if a bacteriological diagnosis verifies this.

The importance of diagnosing diphtheria by this method is emphasized by the following which I quote from an article by Dr. Bissell, of Buffalo, in the Medical News:

"It is generally admitted by all clinicians of experience, that it is often impossible to make an accurate diagnosis either from a clinical or anatomical lesion or from both. There are no constant differences that separate the simple non-contagious forms of inflammation from the diphtheritic type and it is but a very small proportion of cases that an early reliable diagnosis can be reached by any data obtainable. This was conclusively demonstrated in the examination of suspected diphtheria cases under treatment at the Williard Parker Hospital, at New York City, where the diagnoses were made by department diagnosticians and confirmed by the best medical talent. Subsequent bacteriological examinations in these cases revealed that from 30 per cent. to 50 per cent. were not diphtheria but maladies of a non-infectious character.

Appreciate sending a case of follicular tonsillitis to a hospital and having it placed in a ward with diphtheritic patients. This person with reduced vitality is exposed to one of the most dreaded diseases when suffering from a malady to which hardly one in twenty-five succumbs.

Bacteriologists in Europe and America give a combined report of examinations in 8,186 suspected cases in which the bacillus of diphtheria was found 5,943 times or in 72 per cent.

Diphtheria has always been a disease to which children have been subject by reason of a weaker system. Children are often attacked with what older men called membranous croup, which is a mild diphtheria killing the subject more by suffocation than by poisoning. I should like to hazard the opinion, that this same organism which causes the croup in young children often exists in the adult throat without producing any disease other than perhaps a temporary headache and fever.

The character of the disease in epidemics varies greatly as it does in individual cases reaching a low grade of virulence and producing perhaps a croup or malaise depending on the age of the patient or rapidly ascending the scale of virulency and in a case exposed capable of inducing a fatal attack of diphtheria. Croup occurs during

an epidemic of diphtheria frequently and diphtheria can be caught from croup. Some systems are capable of throwing off infection easily, because their high vitality antagonizes the bacilli and its poison and in these cases no membrane forms. Physicians often in treating a case of diphtheria in a family find that other members of the household than the patient are affected with a sore throat, without a membrane forming, in such cases bacteriological methods would demonstrate the bacillus of the disease. These mild cases are capable of producing a virulent diphtheria in others.

Dr. W. H. Welch, of Johns Hopkins University, in a recent article in the American Journal Medical Sciences, quotes from the work of Dr. Park, of the New York Board of Health. He says "that in thirteen families where no isolation was undertaken, when one member was ill of the disease, and in which there were 48 children, and apparently well; 50 per cent of them had diphtheria bacilli in their throats and 40 per cent. developed diphtheria. In families where strict isolation was practiced, less than 10 per cent. had any bacilli. Park says: "All members of an infected household should be regarded as under suspicion, and in those cases where isolation is not enforced, the healthy as well as the sick, should be prevented from mingling with others until cultures or sufficient lapse of time give the presumption that they are not carriers of contagion."

The bacillus does not survive for a very long time outside of the human body; it is very easily killed by heat, sunlight and chemicals. It is spread more by direct contact than the air, and has never been found in the emanations from dead animal matter or in sewer gas.

Dr. Welch, in the same article, says: "We possess no evidence that bacillus of diphtheria finds a natural home outside of the human body, although it may survive for months on objects outside of the body. Park found living diphtheria germs on bits of membrane dried for seventeen weeks and in blood serum cultures seven months old. A small epidemic of diphtheria in my practice I traced to a game of marbles, five children engaged in the game; all were stricken with the disease and two died; the father of one of them told me that the children breathed on the marbles or held them in their mouths. One child doubtless had the disease and communicated it to others. Slates often convey the disease in schools. Emerson and Wright found the diphtheria germ in a ward for diphtheria patients in the dust, beds, pillow-cases, on the hair and shoes of nurses."

Diphtheria is caused by contact with a case or some article of furniture or utensil that another person has handled. Think of the things children put in their mouths—it is the first thing a child learns to do; any object from a marble to their own maybe dirty fingers, and these may have handled a rail, or chair, or handkerchief

that had on it diphtheria discharges. Children frequently trade chewing-gum, partly sucked candy, or apples partly eaten.

All of these things may have been handled also by persons supposedly well. To-day apparently well people are walking our streets in whose throats diphtheria bacilli can be demonstrated and yet they complain of no symptoms and have no objective signs as membrane or enlarged tonsils.

Drs. Park and Beebe, of New York, examined the throats of 330 persons with no history of contact with diphtheria; they found non-virulent but characteristic diphtheria bacilli in 24 cases, virulent ones in 8; the virulence was tested by inoculating guinea pigs. Five of the eight virulent cases came from an asylum in which cases of diphtheria occasionally developed from time to time. One of the remaining came from a house where supposed croup existed 3 weeks previously. Two of the eight children developed diphtheria subsequently. From such cases the disease can be easily transmitted by kissing or by handling an envelope sealed by the lips of such a one.

Now we take up one of the most important phases of the disease from a hygienic standpoint. It has been repeatedly found that after the disappearance of the membrane the bacilli still persist in the throat and are capable weeks after of causing the disease in others.

Welch says, quoting Park, that in examining 752 cases, he found in 325 cases there was an absolute disappearance of the bacilli at the end of 3 days, after the clearing up of the exudate; in 427 cases the bacilli persisted a much longer time; in 201 cases from 5-7 days; in 84 cases, for 12 days; in 69 cases, 15 days; in 57 cases, 3 weeks; 11 cases, 4 weeks; 5 cases, 5 weeks; and in one case, since reported, the bacilli persisted 7 months in the mouth of the patient after disappearance of the membrane. In these cases of persistent bacilli in the throat, cultures were made in the bouillon and injected into guinea pigs. Of 14 pigs, 8 died within 40 hours after infection, the others died in from 3-14 days, one survived after having a large sloughing sore at the site of inoculation. This shows that the bacilli are capable of causing disease long after the membrane disappears. I have no doubt that many human lives have been lost by the physician innocently allowing convalescent cases to mingle with well ones, when the throats of the former were charged with bacilli. A word in regard to treatment of these cases: Dr. B. Meade Bolton, bacteriologist to the Philadelphia Board of Health, tells me that those cases in which Löffler's solution have been used recover sooner and the bacilli disappear earlier than in any other form of treatment.

The practical deductions from all this are manifestly simple. No one is capable of diagnosing 100 per cent. of his cases of sore throat without bacteriological aid. My fellow practitioners tell me that

antitoxin may be good; but their mortality in diphtheria is but 8 per cent. to 10 per cent., whereas antitoxin affords recovery in all but 16 per cent. With all due respect to my fellow doctors, I am convinced that they err in positive diagnosis and a cured follicular tonsillitis poses as a cured diphtheria, since they have not had opportunity to apply bacteriological diagnosis.

This method of diagnosis is valuable where antitoxin is to be employed, it is a very valuable adjunct to prophylaxis, as well as in studying etiology. To sum up, I would say:

1. All cases of suspicious sore throat should be examined by cultural means.
2. All other members of the same family in which the case occurs should also be examined by the same method.
3. All cases should be carefully quarantined until a secondary cultural examination shows the throat to be free from bacilli.
4. Membraneous croup should be considered diphtheria and subjected to the same regulations.

Large cities afford this means of diagnosis to all physicians, many States also endeavoring to do likewise. These regulations, if carefully and persistently followed out, would lead to the ultimate eradication of the disease, which more than any other has stripped countless firesides of toddling feet and babbling little tongues.

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## ADVANTAGES OF BACTERIOLOGICAL INVESTIGATIONS TO BOARDS OF HEALTH.

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By B. Meade Bolton, M. D., Bacteriologist to the Board of Health,  
Philadelphia.

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In view of the establishment almost everywhere of public laboratories, I have concluded that the best use I could make of the opportunity you have given me to address you would be to say something in regard to the establishment of such laboratories and what, in my estimation, should be the character of the work demanded.

If a public laboratory is properly organized, there is no reason why the work done in it should be at all inferior to work done in any other laboratory. That this is the case is abundantly shown by the work that has come from some of the public laboratories in this country and in Europe. I think the usefulness of these laboratories depends largely upon the manner in which they are looked upon by

boards of health. If the board takes the view that a laboratory should be a drudge, it can expect only work of a perfunctory kind. I am convinced that the forlorn condition of many of the scientific men in public laboratories is brought about by their being forced into a hopeless rut.

But if the board is to repose confidence in its laboratory men, it must first be careful in the selection of its men. It seems to me not inappropriate in such a gathering as this to call special attention to the importance of selecting wisely. I have been frequently applied to to give instructions to men who have been selected to conduct municipal laboratories and this seems to me anything but the proper mode of procedure. The men who have already had the necessary training should be selected; they ought not to get their training after they are selected.

Having properly chosen your man and given him your confidence, what should you reasonably expect of the laboratory? I can give my answer to this question best by describing the work of the city laboratory in Philadelphia. This has been conducted in three directions, viz.:

1. The examination of pathological material sent in by physicians.
2. The preparation of diphtheria antitoxin.
3. Experimental work upon questions pertaining to bacteriology.

The examination of material sent in by physicians consisted for the most part in the examination of cultures made from the throats of persons supposed to be suffering from diphtheria, but material of various kinds has been also sent in. Specimens of sputum for examination for tubercle bacilli, urine, cultures from infected wounds and various tumors.

The system adopted for the examination of cultures of suspected diphtheria was modeled largely upon the system in use in New York City. After the laboratory was organized and gotten into working order, the following notice was sent to all physicians in the city:

#### DEPARTMENT OF PUBLIC SAFETY—BUREAU OF HEALTH.

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Division of Pathology. Bacteriology and Disinfection. Laboratory of Hygiene.

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Philadelphia, May 23, 1895.

Dear Doctor: The Bureau of Health is now prepared to make examinations of suspected cases of diphtheria. The culture tubes will be found at the police stations, named on the accompanying card,



and it is requested that where physicians avail themselves of the services of the laboratory that they should themselves inoculate these tubes from the throat of the suspected case, or should authorize a medical inspector to do so.

These cultures should be made in all cases as early as possible, for the specific organism often disappears from the throat during convalescence. The full benefit of a positive diagnosis can only be obtained where cultures are made at an early stage.

#### Directions for Making Inoculations.

Inoculations should be made by rubbing the cotton swab attached to the end of the wire contained in the test tube gently but freely against any visible exudate, and then drawing it over the surface of the culture medium without breaking the surface of the latter. The swab should then be replaced in the tube from which it was taken, and both tubes be replugged and put back into the box. Return the box to the station from which it was obtained, as soon as possible, or bring it directly to the laboratory. The tubes will be collected every afternoon, examined the following morning, and reports will be mailed by one o'clock p. m. The attending physician can obtain information, however, by telephoning directly to the laboratory after that hour.

Cases which prove to be false diphtheria will not be visited by the health inspectors unless requested by the attending physician. Cases, on the other hand, which prove to be true diphtheria will be subjected to the usual rules and regulations governing contagious diseases.

The bureau is also prepared to examine blood, urine, gastric secretion, sputum for tubercle bacilli, and other pathological material. Instructions and directions for inoculating the tubes and for collecting pathological material for examination will be gladly given at the laboratory.

All communications should be addressed to Dr. B Meade Bolton, director of the laboratory, rooms 715 and 717, Bureau of Health.

By order of the Board of Health,

WILLIAM H. FORD, M. D.,

President.

A. A. HIRST,

Secretary.

In response to this circular physicians have availed themselves largely of the services of the laboratory.

The culture outfit for diphtheria diagnosis, a sample of which I show you here, consists of a tube of prepared culture medium and a tube containing a swab of cotton on an aluminum wire. I have found by experience that No. 14 wire is better for this purpose

than the thicker wire at first used. Accompanying the tubes is a little book in which the physician makes his notes of the case.\* A preparation of every case has been saved for reference and the books are also kept. You will notice that the book has a space left to be filled out at the laboratory with the results of the examination. These are denoted by signs stamped on with rubber stamps, the meaning of which are explained in the book itself.

The results of the examinations are communicated to physicians by means of one of the cards which I pass around. So much for the detection of diphtheria.

It has not been necessary to elaborate any particular system for the examination of other kinds of pathological material, such as sputum, urine, tumors and the like. A good deal of material of various kinds has been sent in, but reports have simply been written in each case.

Samples of water have also been examined.

So, to sum up, I should say that you should expect from your laboratory prompt recognition of cases of diphtheria, consumption, and some other diseases and if the usefulness should always be restricted to its present sphere this would surely justify the establishment of the laboratory.

The preparation of the diphtheria antitoxin is also considered a part of the work of such laboratories; and the preparation of antitoxins for other diseases must necessarily follow also.

For the benefit of those who are not familiar with the subject, I would say a few words in regard to this method of treating infectious diseases.

It is now known that many, if not all, infectious diseases are caused by the products of growth of microscopic organisms for the most part bacteria. These bacteria get into the body in various ways. They are taken in with the food or drink or through wounds in the skin, or are taken in with the breath. In whatever way they may be taken in they cause disease by growing and producing poisons that are now called toxins. If the animal recovers from the disease the toxins are neutralized in the animal's body by an antitoxin which is produced. Take, as an example, diphtheria. If the bacteria of diphtheria get into the throat and cause the disease, and the patient gets well, there is the production of an antitoxin in the body of the patient. In like manner, if the diphtheria bacilli or the products of growth of the diphtheria bacilli are injected into an animal there is an antitoxin produced in the animal. Now this antitoxin is not only of use in curing the animal in which it is introduced, but if it is drawn out of the animal it can be used to cure other animals or man. The antitoxin is found in such ani-

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\*A copy of this book can be had on application.

mals in the fluids of the body, notably in the liquid portions of the blood, but it is also found in the milk of lactating animals and elsewhere in the body. So the method of preparing the antitoxin for diphtheria consists in injecting, gradually, a large quantity of the diphtheria toxin into a large animal and then drawing off the blood of the animal. Of course there are many details and precautions to be observed that it is not necessary to go into here, but what I have stated above is essentially the process. As you all know, horses are universally employed for the purpose. A very clear and interesting description of the method of obtaining the antitoxin is given in an article by Dr. Charles B. Fitzpatrick in the New York Medical Journal, April 27, 1895.

The experimental work of public laboratories should be, I think, just now all directed towards the production of antitoxins for other diseases than diphtheria. Some diseases offer opportunities for good results in this direction.

It is apparent from the above that there is work enough for public laboratories and that they deserve general recognition and support.

The points I have wished to bring out in what I have said are these:

Be careful to select well-trained men for your laboratories, give them well-equipped laboratories, do not overburden them with drudgery and you will be amply rewarded. You can expect the prompt recognition of many infectious diseases, the preparation of diphtheria antitoxin, and in the near future probably the antitoxin for some other diseases as well, and finally, advances in knowledge of infectious diseases.

In opening the discussion, Dr. Benjamin Lee addressed the association as follows:

"Mr. President: You have well said that no more important subject could be offered before this association of health officers than the means for restricting the spread of diphtheria. You, of course, know why this is so important a matter just at the present time. I need hardly call your attention to the very great increase of diphtheria in this State during the past two or three years, or what have been the experiences of certain towns here and there. Certainly we have had an immense increase. I would say that in the last four or five years diphtheria has multiplied five fold in the State. At the present time it is the most terrible of communicable diseases with which we have to deal if we except consumption, which still keeps the lead. Next to that we must rank diphtheria. Scarlet fever which used to sweep off such large numbers of our children has for some reason or other become less alarming. Only now and then we have a severe epidemic; but I think if we go over our health

statistics we shall find that measles is killing more now than scarlet fever. Diphtheria, however, has a mortality as you have been told, of at least forty per cent., and with the use of the serum the mortality is still high. If, therefore, we can obtain the means for determining at the outset of any suspected case, that that case, however light, is a true case of diphtheria, dangerous to the other members of the family and dangerous to the community, it certainly becomes the duty of all health officers to make use of that means. Such a means we have at present and it is a matter of great mortification to the State Board of Health, that it has not been able to take hold of this matter as some state boards of health have done. We have applied more than once to the Legislature to give us a laboratory of hygiene in which investigations of all these questions could be carried on, and from which a helping hand could be extended to every board of health in the State in these matters of diagnosis of diphtheria and of consumption, for the means is equally applicable in both of these diseases. As indicating how very practical this matter is, and how easy it is for boards of health even at a distance to make use of it through the State Board of Health, I would like to refer to a case which occurred a few weeks ago in one of the interior towns of the State. A communication was received from the local board of health stating that one physician in the town claimed that he had in his practice diphtheria, in one and possibly in two families, while not another physician in the town had cases. They had cases of follicular tonsillitis, sore throat and such as that, which they recognized as not diphtheria. The other physicians felt that it was very strange that this one man should have diphtheria in his practice and no one else, and they remonstrated to the local board of health and held that an investigation should be made in order to prove to him that his cases were not diphtheria. The matter was brought to the notice of the county medical inspector and he also addressed communications to the State Board of Health, requesting that this physician should be reprimanded because he persisted in calling his cases diphtheria, as no one else in the town did. The physician himself took the only sensible means of deciding the case. He took specimens on cotton from the throats of his patients, and sent them at once to the Secretary of the State Board of Health, who immediately placed them in the hands of the assistant bacteriologist, and within thirty (30) hours the cultures showed the cases were virulent diphtheria. The report was sent by telegraph both to the physician and to the local board of health. Now, what was the consequence of this? That within a couple of weeks the Secretary was applied to by the local board of health for antitoxin, and the second day after the first application came a second request, showing that not only had

this physician who had correctly diagnosed his cases had diphtheria in his practice, but undoubtedly some of the other physicians were treating as simply sore throat, diphtheria. This examination could no doubt be multiplied fifty fold all over the State. The State Board of Health has deeply felt its responsibility in this matter, and although it has been unable to get such an establishment as desired, it has determined to do the best that it can under the circumstances, and it proposes to issue a circular at an early date on these lines—that is, to offer to boards of health and physicians the services of its laboratory in Philadelphia, and to make a charge per annum according to the population of the town. Upon application a swab will be sent out, and with it instructions for rubbing over the affected parts, to secure specimens of the disease germ if present.

"It was felt that in many cases it would not be wise to attempt to send the culture tubes through the mail and, therefore, we adopt the plan of sending sterilized swabs. These swabs will be placed in the tubes and returned at once by express. The report will be returned in twenty-four hours. Owing to the length of time the live bacilli will continue to infest the throat after a case has apparently recovered, it makes it very important that from time to time, for a few days or even weeks in some cases after apparent recovery, swabs should be applied and microscopic investigations should be made.

"The Board has instructed its assistant bacteriologist to prepare directions for using the swab, and for the reports which are to be made out at as early a date as possible. A circular will be sent to all boards of health throughout the State as well as to physicians, in order that they may understand that they can avail themselves of this opportunity.

"It will be seen that it is the intention of the State Board of Health to put a sufficient number of these sterilized swabs in the hands of every board of health in the State, and that on receiving notification from any board that it desires to be so supplied, the number suggested will be sent, the idea being that a board of health of any city or town not having a bacteriologist of its own and desiring to avail itself of this Board, will notify the Secretary of the State Board of Health whenever it desires a new supply of swabs. They will then be furnished in such quantities as are desired, and inasmuch as it will undoubtedly create considerable expense, it was felt that the proposed arrangement by the year should be made in order to put the Board in possession of funds to at once supply any demands that may be made upon it."

M. G. Lippert, Phoenixville: "I think that the local boards of health in the boroughs will be only too glad to avail themselves of the assistance offered on the part of the State Board of Health, and I think that I may say for our board at Phoenixville, that we wel-

come the offer made by the Secretary of the State Board of Health, and we shall no doubt avail ourselves of that offer. I can only hope that other boards will do the same, and I further express the hope that we may be able to prevail upon the next Legislature to be a little more generous toward the State Board of Health, and toward the local boards in this instance."

H. H. Whitcomb, M. D., Norristown: "I was very much pleased with these two papers, and agree with Dr. Pitfield that we need a more exact method of diagnosis. I, at the same time, hesitate to express an opinion that is contrary to my own belief. I do not like to acknowledge the fact that I cannot diagnose diphtheria. I am convinced that many cases are not properly diagnosed. While we believe bacteriologists are able to aid us in making diagnosis, we are not convinced that antitoxin serum is going to help us very much."

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### THE EFFICIENCY OF ANTITOXIN AS A REMEDIAL AGENT IN DIPHTHERIA.

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By Joseph McFarland, M. D., Philadelphia.

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I hope to present the subject of antitoxin to you to-day in such a manner as to convince the most skeptical mind of its efficiency as a remedial agent in diphtheria.

You are all familiar with the fact that vegetable and animal cells are capable of producing powerful poisons; thus, in the vegetable kingdom we find the poppy producing morphia, the castor oil bean producing ricin, the calabar tree producing abrin, and many other examples will occur to your own minds. In the animal kingdom the best examples I can give you would be the cells of the venom glands of the rattlesnake and cobra, which you know to produce poison deadly to man.

The next thing I shall point out to you is that man and animals can accustom themselves to these poisons so as to endure many times the original injurious quantity; thus, we are familiar with the fact that to those who have not used tobacco, smoking a single cigar causes physical prostration, while the habituant can smoke a dozen with impunity. You are all acquainted with the fact that there are opium eaters who can take many grains of morphine in the course of a day, experiencing an exhilarating instead of a toxic effect. It has also been clearly shown that the hog, which in the

early days of our American civilization was used to rid infested fields of rattlesnakes, possessed no natural immunity to snake poison, but because of the slow absorption from the thick layer of fat beneath the skin, gradually became accustomed to the poison introduced beneath the skin, by the repeated bites of snakes. It is also highly probable that the immunity possessed by snake-charmers to the poison of the cobra depends upon the fact that they have frequently suffered from the introduction of small quantities of the poison, by superficial bites acquired by handling the snakes. The peculiar tolerance to poisons in such cases remained inexplicable until a very few years ago, when Emil Behring Stabsarzt in Berlin discovered that in the bloods of animals which were accustomed to the poisons of diphtheria and tetanus there occurred a new substance, which not only was capable of protecting the animals in whose body it was generated, but also of protecting other animals, into whom the serum of the protected animal was injected.

It must be clearly understood that antitoxin (as this new substance is called by Behring) is a new substance, having nothing to do with the normal blood. The effect of the antitoxin seems to be to stimulate the body cells in such a way as to enable them to endure the poisons mentioned; they do not act as chemical neutralizing agents, as has been clearly shown by experiments; the toxin remains unaltered after having mixed with a sufficient quantity of antoxin, to save the life of the animal into which it is injected.

The next point I desire to make is that the diphtheria antitoxic serum does not stand out conspicuously as one single remedial agent, but is one of a group of similar bodies. It has been shown by Fraser and Calmette that in the animals accustomed to rattlesnake and cobra poisons, antitoxic substance specific for their particular poisons are generated, and are capable of protecting other animals into which they are introduced.

Ehrlich has shown that when animals are immunized to very large doses of ricin and abrin, antitoxins, namely, anti-ricin and anti-abrin, are produced in sufficient quantity to protect the lives of non-immunized animals. Behring, Kitasato, Wernicke and others have shown that the anti-tetanus toxin and anti-diphtheria toxin, now so well known, always occur in the blood of animals immunized to tetanus and diphtheria.

The toxin of diphtheria is the poison produced by the diphtheria bacilli, or, as we might express it, is made by the diphtheria plants, the well known organisms which occur in the diphtheritic membrane; the symptoms of diphtheria are not due to the lesion of the throat, but to the circulation through the blood of these poisonous substances produced by the bacilli. In treating diphtheria it is not the condition of the throat, but the general toxæmia, to which at-

tention must be directed. It is known to every physician that poisons can only be combatted by their antidotes, and unfortunately it is known to physicians and laymen that for the poisons which are fatal in the specific diseases, that is, scarlatina, diphtheria, small-pox, typhoid fever, etc., there are no antidotes, but that the individual must die, unless in some way his system is capable of producing a sufficient amount of antitoxin of some kind or other, to annul the effects of the poison in his blood.

Each antitoxin is antidotal for but one poison, that is to say, tetanus antitoxin for tetanus toxin, and diphtheria antitoxin for diphtheria toxin, and so on. Antitoxins have no effect whatever upon the vitality of the diphtheria bacilli or upon any bacilli.

In cases of diphtheria which have recovered after the use of antitoxin, an examination shows the throat to contain bacilli quite as virulent as in the beginning, but remembering that the symptoms of the disease are due to the circulation of the poison through the blood, we understand the recovery from the disease when we remember that the poison is no longer poisonous after the administration of antitoxin.

From this brief survey of the salient points in the theory of antitoxin, I wish to turn to what seem to be the most particular questions for a body like this to consider. It is rather their function to make sure that the community be provided with good antitoxin (that is, a strong antitoxin) in a condition of proper preservation, than to decide in general upon the efficiency of antitoxins as a remedial agent. Upon this latter question there is no possible doubt; the statistics of the world, comprising more than 20,000 reported cases, show a diminution of the death rate in diphtheria patients from 45 to 50 per cent. before the antitoxin was used, to but 10 to 15 per cent. since it has been used.

First, the antitoxin used must be sufficiently strong; it is impossible to estimate absolutely the strength of a biological product, therefore, no two persons investigating the same product will ascribe to it exactly the same strength. The reason for this is very simple; first of all, the test for determining the strength of an antitoxin depends upon an accurate knowledge of toxin, and the smallest certainly fatal dose of the toxin must be calculated. You observe, ladies and gentleman, it is not a certainly fatal dose of the toxin that is to be arrived at, as a gallon of diphtheria toxin would certainly be a fatal dose for a guinea pig, but the determination of the smallest certainly fatal dose is the matter which requires great nicety of calculation, considerable time and sacrifice of a large number of animals. The man who determined most accurately the minimum fatal dose, will find the greatest strength in the antitoxins; the man who is careless concerning the minimum fatal dose and



has it but a little larger than it really should be, will find the antitoxin correspondingly weaker.

Added to this consideration of the minimum fatal dose must be the personal equation of the experimenter and the individual susceptibility of the guinea pig. That which is known as a normal serum is one of which one-tenth of cc. will protect a guinea pig against ten times the smallest certainly fatal dose of toxin. The serums ordinarily employed for therapeutic purposes are 100 times as strong as these.

I hope I have made very clear, in this brief statement, the fact that inexperienced persons cannot test diphtheria antitoxin serum, and that the small amount of difference in the test is a matter to be expected, no matter who works upon it.

I have tested many of the serums which are upon the market, and have found that, with one exception, they have the strengths claimed. Very fortunately the exact strength of the antitoxin is of no importance from a therapeutic consideration, because the exact required dose can never be estimated. You will understand that to give an exact dose of antitoxin would mean to know exactly how much poison was to be neutralized in the blood, while this is a matter which can never be determined. There are no doubt cases in which we give ten times as much antitoxin as is really necessary. At other times no doubt we give one-tenth as much as is necessary.

The preservation of the antitoxin is also a matter of great importance. Diphtheria antitoxin serum does not easily spoil; I suppose I have seen from 25 to 50 gallons of antitoxic serum, some of this serum has been in my hands for nearly a year and yet I have never seen a single drop of serum, prepared by myself or anyone else, that was in a condition of decomposition.

The scientific minds among you are doubtless aware that freshly drawn blood is germicidal and retains its germicidal power for a considerable length of time; it would be unwise, however, to depend upon this natural action for the preservation of a product which is to be sent to the ends of the earth, to be kept for varying lengths of time, from a month to a year in all probability, and to be used by the wise and unwise as well; therefore, it is best to add to the serum some substance which shall not interfere with its virtue, which shall be harmless to the person into whose system it is to be injected, and yet which will preserve the serum from the action of putrefactive micro-organisms. Various substances have been employed. I have the pleasure of showing you serums which have been preserved by the addition of camphor, of 1 per cent. of chloroform, 1 per cent. of salicylate of sodium, of 0.5 per cent. of carbolic acid and 0.5 per cent. of trikresol. Of these various substances I

prefer the carbolic acid and trikresol, because their antitoxic actions are much more certain than the others; both of these agents when added to the serum cause a rather copious, flocculent precipitate, which must be removed by filtration, but which does not interfere with the virtue of the serum as a remedial agent. Trikresol gives the filtered serum a peculiar opalescent quality and slightly different color. My personal preference is for trikresol as a preservative, since it is three times as germicidal as carbolic acid, and less than one-third as poisonous.

I must mention some of the objections that have been brought up against the use of antitoxin in combatting diphtheria. At one time it was reported that sudden death was liable to follow its injection. Its most bitter opponent will at the present time scarcely urge upon us that sudden death is more likely to follow the use of antitoxin than diphtheria treated without antitoxin.

Some one has said that paralysis is apt to follow in the cases of diphtheria where antitoxin is used. I think the experiences of the medical profession will bear me out that paralysis is likely to occur in any cases of diphtheria, and that the antitoxin is unjustly condemned as the cause of it.

It was formerly also urged that the antitoxin has a destructive action upon the kidneys and that nephritis or albuminuria followed its administration, but later statistics have shown that these troubles are less numerous in cases treated with than those treated without antitoxin.

I have also heard it urged (generally by laymen who very naturally hesitate about having a large quantity of material injected into the bodies of their children) that there is a danger of cases which are not diphtheria being made diphtheria by the injection of antitoxin. Why, ladies and gentlemen, what has antitoxin to do with diphtheria? The antitoxin is horse's blood, there are no diphtheria germs about it, cannot be any in it. It would be quite as possible, yes, quite as probable, for one to have a castor oil plant develop in his intestines, after taking a dose of castor oil, as for a child to get diphtheria from an injection of antitoxin.

Dr. Bolton, in his paper, has already given you in brief, the method for the production of antitoxic serum, but in order to make more clear to you this illustration of the castor oil plant which I have mentioned, let me show you that in the preparation of the serum, the cultures of the diphtheria bacilli, which are to furnish the toxin, are first killed by the addition of a germicide, and then filtered through unglazed porcelain. This perfectly sterile, poisonous substance which has been but is no more a culture of diphtheria. is injected in increasing quantities into the subcutaneous tissues of a

horse, until after a varying period of time, experiment shows us that this blood contains antitoxin. The horse is then bled from a vein, the blood allowed to coagulate and the clear serum which is the antitoxin pipetted off and preserved by the addition of trikresol. It is clear to you all that the horse never had diphtheria, that in his blood no living or dead micro-organisms were ever present, and, therefore, that in the serum from his blood, with or without the addition of the germicide, which is added to it to protect it from future contamination only, there would be nothing that could produce disease. The castor oil is made from the castor oil bean, diphtheria antitoxic serum is not made from the diphtheria plant, but is a new substance, derived from the horse's blood. You can see how much more possible would be the former than the latter in my illustrations.

The last objection to its use is that it does not in all cases give the results claimed for it. We cannot accept the statistics of those who have used it in a dozen cases, against those who have used it in a hundred, nor can we place any reliance upon statistics of those who use it in combination with other remedies.

Its action upon the lower animals is invariable; its action in proper doses (large enough doses) in the early stages of the disease, as it affects children, shows almost no fatality. Every case cannot be cured for two reasons: first, because we do not know how much toxin is in the blood, and, therefore, frequently do not administer enough of this antidote; second, because the toxin in many cases produces a rapid disorganization of the nervous centers, which can never be regenerated; that a few cases must die for the reasons given is very small ground for a rejection of the remedy, the results of whose administration by the most careful men, in all parts of the world, has shown its efficiency to be so extraordinary as to warrant the assertion by some that it is God's latest and best gift to his children.

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**THE PRODUCTION, TRANSPORT, SALE AND DELIVERY OF  
DAIRY PRODUCTS SHOULD BE UNDER THE SANITARY  
CONTROL OF THE LOCAL BOARD OF HEALTH WHERE  
THESE PRODUCTS ARE CONSUMED.**

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By Edward O. Shakespare, M. D.

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The title of this paper, prepared in response to an invitation of your committee, expresses in general terms the opinion which the writer has formed after closely studying for some years the relations of the general milk supply to the public health.

The liability of many of the products of the dairy—and especially milk—to become in one way or another infected with the germs of dangerous diseases before they reach the consumer hardly needs discussion or elaboration at the present time. Numerous careful and impartial investigations by most competent observers and experimenters in America and in Europe have placed this fact beyond reasonable dispute. Many an epidemic of typhoid fever and of diphtheria, and a considerable number also of scarlet fever, have been traced to an infected milk supply. Cholera infantum, that veritable scourge of young children living in the cities, has its chief origin and factor of mortality in a milk supply vitiated by the presence and activity of numerous extraneous bacteria. The existence of tuberculosis in the first years of life may be fairly attributed in the majority of instances to the consumption of milk infected with the bacillus tuberculosis. What relation measles, whooping cough and influenza may have with the dairy still remains undetermined; but viewed in the light of the present knowledge of the etiology and mode of spread of the last three diseases, it seems possible enough that they also may ultimately prove to be traceable in many cases to the consumption of contaminated milk.

There is ample reason, therefore, not only to justify but even to necessitate an effective intervention of the health authorities to regulate and control, from the standpoint of public sanitation, the production, handling, sale and delivery of the products of the dairy.

What are the essential elements of such an effective intervention? They would appear to be comprised in the following propositions:

First. The intervention should begin at the beginning and continue until the consumer is reached.

Second. The intervention should be executed first and last through the accredited and responsible agents of the local board of health of the consumer.

To undertake to elaborate these general principles in much detail were, perhaps, beyond the proper scope of such a paper as this. But it may not be amiss to throw out some outline suggestions.

As to the first of these essential elements, it would be well to keep in full view two fundamental truths:

(a) The dairy farm is the one chief source where milk becomes infected.

(b) The dealer's shop for reception of the milk supply and its distribution to the consumer, is the other chief source of contamination.

Unless the local board of health can prevent infection at both of these chief resources, it need not hope to do very much toward great curtailment of the morbidity and mortality due to the use of the infected milk among the consumers within its district.

But, unfortunately, it is only one of these chief sources of infection that health boards now undertake to watch more or less closely—the shop of the milk dealer. If the source of milk production—the dairy farm—is to-day reached at all by the local health board, it is only indirectly and most ineffectively; and yet it is precisely here that such infections as that of typhoid fever, diphtheria and tuberculosis most frequently find entrance into the milk.

A sanitary inspection—embracing the condition of the milch cows, their food and surroundings, the purity of the water supply, the health of the dairymen, and the mode of collecting and handling the milk at the farm—made at times unexpected by the milk producer, and repeated at varying intervals, for the purpose of excluding diseased animals from the dairy herd, and of obviating all kinds of infection in the milk at this source, would seem to be absolutely essential for adequate protection of the health of the consumer. (It goes without saying, that the application of the tuberculosis test—the only reliable means at present known for the detection of tuberculosis in apparently healthy cattle—should form the basis of exclusion of this very prevalent disease from the dairy herd.) And, of course, a rigid sanitary supervision of the shop and operations of the milk dealer at the other end of the line is equally necessary.

As to the second of these essential elements, the health interests of the consumer, demand that the sanitary supervision and regulation of the milk supply shall be thorough and comprehensive, above all that these inspections—of such grave importance to him—shall be made by agents whom he can most rely upon and trust as least likely to be guided or influenced by commercial interests or mercenary motives. It requires neither great acumen nor much experience only a little insight into the carelessness and gross frauds which so commonly disgrace the general milk trade of the State of Pennsylvania, to arrive at the firm conviction that the only inspectors who could be safely trusted by the consumer would be those appointed and controlled by the local board of health, the authority—next to the consumer himself—chiefly and most nearly interested in the conservation of the public health of the district. Inspectors appointed and controlled by such a disinterested and competent authority should, from the nature of the case, be more earnest and impartial in the performance of duty, and far less amenable to the venal temptations of interested producers and vendors, than would be the agents of such a service whose employment is dictated or influenced by trade interests. In fact, it seems to be self-evident that sanitary inspection of dairy farms for the protection of the health of the consumer, unless it be performed under the direction and control of the guardians of the public health, must certainly prove to be illusive.

The best machinery by which to exercise such a sanitary control and supervision of the milk supply of localities as we have thus briefly suggested in outline would seem to be that afforded by a proper system of licenses to milk producers and milk vendors, the licenses to be grantable or revokable by the health authority within the limits of whose jurisdiction the consumer resides, or the consumption takes place. Such licenses should be of nominal cost to the milk producer and more expensive to the milk vendor (for the reason that the invested capital of the milk producer is usually much greater, and the profits much less than are those of the milk dealer). These licenses should be issued to the applicant on condition that the inspectors of the local board of health of the consumer have free access at all reasonable times to the premises of the holder of the license, for the purpose of making such sanitary inspection as the respective board of health may authorize and direct. All milk from unlicensed producers and vendors should be prohibited entrance, sale, handling or distribution within the health districts in question.

Some may think, and, indeed, the objection has been urged, that such a system of comprehensive inspection of the whole operations of the milk industry, engaged in supplying milk to a community; would constitute an unwarranted interference with the business and rights of the individual citizen. But it has been truly said that the business of the production and sale of the milk supply is one of the most dangerous of human occupations. Certainly this truism must furnish ample warrant for a wise, just and reasonable regulation by law of the conduct of this dangerous business.

Assuredly the people likely to be injured through the careless or fraudulent prosecution of this highly dangerous occupation have the right to secure their protection by appointment and control of inspectors on whose competency and trustworthiness they can rely.

M. G. Lippert, C. E., Phoenixville, opened the discussion by referring to an ordinance under which they had been working and referred to the act of 1885, applying to cities of the third class, on which that city had based its ordinance except with regard to penalty, which could not be applied to their ordinance, but that they could impose such fines as they saw fit. This ordinance also required the registration of milk dealers, and such fees should be collected as the board of health may direct, and a license issued for \$2.00. The first year nearly all the milkmen, excepting one or two, complied with the ordinance. They claimed that the board of health had no right to collect fees and require licenses and sooner than pay, they would fight in court. We consulted our solicitor about it. He said we had a right to insist upon it under our ordinance, but

after looking further into the matter he advised us not to enforce the ordinance, as he could not find any authority for us to insist on milkmen taking out licenses.

"The second year we could not require a license, but we insisted on licenses being taken out. We have them all in now except one or two, and I think they will not resist the requirement any further. It would be interesting to find out whether boards of health have the right to insist on registration on the part of milk dealers, which is only another form of a license.

"While I am speaking about milk, Mr. President, I would like to say a few words in connection with the legislation bearing on the question of milk inspection regulating the sale of milk. It seems that the laws which have been enacted by our Legislature are very unsatisfactory and deficient. There is an act dated April 20, 1869. This act authorizes the cities and boroughs to provide for the inspection of milk. Under this act, of course, councils may enact an ordinance bearing on the subject; but you all know how unsatisfactory it is to work on an ordinance without having a law to back it up, that provides a penalty in the shape of imprisonment or fine or both.

"On May, 1885, another act was passed. This act provides that any person or persons who shall knowingly sell or exchange any milk which has been adulterated, etc., shall be deemed guilty of misdemeanor, etc. The next provision is that relative to the adulteration of milk and marking of the milk.

"Next an act was passed in July, 1885, applying to cities of the second and third class. The act is quite unsatisfactory in its provisions. I will just give you the provisions very briefly. The act prohibits the adulteration or selling of impure milk. I think it is pretty well known about the milk exchange and the failure of the subsequent attempts to extend this bill so that it would apply to the Commonwealth, has been attributed to the powerful influence of that lobby.

"In the session of 1893, an attempt was made by a codification of what was called a 'pure food act.' Another attempt was made during the recent session of the Legislature, and was strongly backed up by the board of health of Philadelphia, and I think the State Board of Health endorsed the act too, but it failed. It would be well to repeat the attempt at the next session of the Legislature and try to extend the application throughout the Commonwealth.

"Another feature has come to my knowledge; that inasmuch as that act only applied to cities of the second and third classes it has been declared unconstitutional by the city of Pittsburgh.

"An act was passed at the recent Legislature as is generally

known as the 'pure food act,' which, although it does not attempt to establish a standard for milk it at least provides against the adulteration of milk. Section one defines what shall be considered adulteration.

"Under this act the board of health of Philadelphia brought suit against the sale of separated milk. It is the case known as the Commonwealth vs. Huffnell, and it was the case of a party selling separated milk. This party was prosecuted for selling separated milk under this act, and the court charged the jury that if they thought that they were convinced that the milk had really been separated milk they must convict the defendant, but if it was simply skim milk they could not. The jury found that the party had been selling separated milk and the defendant was convicted. This seems to be a very satisfactory termination.

"I might suggest that a new attempt might be made at the next session of the Legislature to enact a bill in behalf of the imperfect milk inspection.

The chair would beg to suggest that this subject might be referred to the Legislation Committee, that they consider the subject and prepare some legislation to be offered at the next meeting of the Legislature.

"The act of 1885 was a most excellent one, but referred only to cities of the second and third class.

"Our board of health had occasion to bring suit under the provisions of that act for its violation, and our court decided it was unconstitutional for the reason that it was 'special' legislation, only applying to cities of the second and third classes, and in doing so complimented the bill very highly and expressed regret that it was incomplete and unconstitutional.

"Mr. Beitler, director of public safety, Philadelphia, took up that subject last winter and prepared a bill based on the act of 1885, providing that it should apply to the entire Commonwealth, and it was offered in the Legislature and referred to the Committee on Public Health and Sanitation in the House. After considerable delay, Mr. Beitler succeeded in getting a hearing before the Committee and that he had the arguments in favor of the bill, but unfortunately the milkmen had the votes. It is worth a trial to get a good milk act passed, and I beg the subject be referred to the Legislative Committee."



PROCEEDINGS AND PAPERS OF THE NINTH STATE SANITARY CONVENTION, HELD IN WILLIAMSPORT, MAY 21-22, 1896.

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The convention was held under the auspices of the State Board of Health and of the board of health of Williamsport, in the court house.

The meeting was called to order by Hon. John J. Metzger, president judge, at 2 p. m.

Prayer was offered by Rev. Julius Herold.

The Chair then addressed the convention:

"Gentlemen: I desire to say to those present, that since my attention has been drawn to sanitation, I find it of more importance than I dreamed of. It has been a surprise to me that so little attention has been paid in the past to this subject, especially in view of the fact that nothing can more deeply interest the public than the best means of preserving the health and lives of the citizens. No doubt, every one of us, when we come to reflect and learn the great advantages resulting from sanitary measures properly enforced and applied, will find that we never understood its importance.

"One of the purposes of this convention, as I understand it, is to arouse a more deep interest in this important subject, and for this reason I am sorry that there is so small an attendance. We hope this will be remedied later, for the subjects to be discussed will not only be interesting, but extremely edifying. These discussions will be by men who have made it a study, and who are able to enlighten us. A few years ago there was but little legislation on this subject, and few local boards of health. There was great difficulty in enforcing any regulations to prevent the spread of disease, or to eradicate epidemics, and the courts were often called upon to settle questions on these matters. In fact, I have had a little experience in this line. It was doubted by some very learned lawyers whether there was sufficient law to enable the community to protect itself against the ravages of diseases that were of a contagious and infectious character, by prescribed rules to prevent their spread. It is difficult, and always has been, to cause a community to see that there are certain principles which are the very foundation of society which must not be disregarded in order to preserve the body; and it is unquestionable that there is inherent power in every community to act against nuisances which may destroy life or produce disease. If there was any doubt, happily it has disappeared since the organization of the State Board of Health, which, as you are aware, was

created by the act of 1885, giving them considerable power, but not as much as they ought to have, as regards general supervision over sanitary matters in this Commonwealth. Since then, we may consider that this subject of sanitation became a study, and is practiced to a greater or less extent in all the larger cities and towns of Pennsylvania, and that body has, in pursuance of one object of its creation, been instrumental not only in producing a great degree of interest on the subject, but also in procuring needed legislation, with the powers to carry out sanitary measures, and enabling them also, by the creation of local boards, to do many things which they could not do before.

"I can remember our own city, but a short time ago, when it took a brave and fearless man to enforce sanitary regulations here. We had such a man, fortunately, in Dr. Richter, who had been health officer for a number of years, and who understood the situation a great deal better than most people who should have understood it better than he. It made him, for some time, very unpopular; but he persisted until, I am happy to say, now this city has the best sanitary regulations in the State. The effective work done by our board through our health officer has been the means of giving us the best water to be found in the State.

"As all are aware, the city has passed through two very serious floods within the last seven years. Immediately thereafter, any person walking these streets would have been astonished at the destruction. The streets were full of filth and debris of all kinds—how could the city escape an epidemic? Yet, owing to the vigilance of our local board of health, the efforts of our health officer, and the regulations which he enforced, the city was cleaned in a few days, private premises were also put in the best condition, and no disease followed."

After announcing the subject for the evening, he introduced Mr. J. B. Dougal.

Mr. Dougal said: "Gentlemen: Notwithstanding the fact that Williamsport enjoys a reputation as a desirable place for conventions to meet, I believe this is the first time since the organization of the State Board of Health that we have been honored as now. We are vain enough to believe that our city is above the ordinary in point of attractive scenery. No other city can compare with it in beauty, in convenience, and for all that is necessary as a meeting-place for a convention. To-day it is considered to be one of the healthiest cities of the State. I can remember when it was regarded otherwise. It took an advanced step when it passed the ordinance creating a board of health, and how grudgingly the authorities gave the few dollars needed to carry out the rules, yet in spite of all

discouragements, they have brought matters to such a point that there is not a citizen but feels proud of this city. I recognize the importance of this convention, and I am sure our most progressive people are in sympathy with and appreciate the seriousness of your work. We know what you have accomplished, but there are herculean duties before you. We extend to you the warmest welcome.

"The law has very properly given the State Board a wide scope. In looking over it I find there is not a question that relates to the health of the people that this Board has not in its control. Suggestions cannot help but have great weight when given by this body. I would be glad if the State would early take up the question of quack medicines and pass such laws as are needed to stop this fraud. I wonder if the people realize the amount of harm from this source? Has it ever occurred to you, gentlemen, that your physicians are obliged to pass the test of examination before they can practice? So with pharmacy; yet anybody can prepare a quack medicine. This has extended to such a degree that the press of the country is loaded with it. See what a power it is in our land. I think this properly comes under your supervision, and we are willing to aid you in ridding the country of this fraud.

"On behalf of the board of trade which I represent, I desire to welcome you to our city. I am happy to offer you the courtesies of our city, and trust you will be so well pleased that you will desire to return."

The Chairman then announced, as the first subject, "The Control of Tuberculosis," and announced Dr. L. F. Flick, of Philadelphia, the president of the Pennsylvania Society for the Prevention of Tuberculosis.

Dr. Flick then read his paper.

The next paper was by Dr. Leonard Pearson, the State Veterinarian, who had been called away by the need of inspecting some diseased animals at a distant place, and Dr. Jos. McFarland read it for him: "The Diseases of Domestic Animals Communicable to Man."

Dr. S. S. Koser, of Williamsport, offered the following:

"Whereas, There is now pending before the Congress of the United States a bill to prohibit vivisection, known as Senate bill No. 1552, entitled 'A bill for the further prevention of cruelty to animals in the District of Columbia,' which, if passed, would at once paralyze proper valuable scientific investigation in the various scientific laboratories and departments of the National government, in the universities already established and about to be established, would render it impossible to manufacture diphtheria antitoxin, and other toxins for the cure of disease in the District of Columbia and the various territories; therefore,

"Resolved, That the Pennsylvania State Sanitary Convention earnestly requests both Houses of Congress to defeat this measure, and that the secretary of this convention be instructed to promptly forward this action to both the Senators of Pennsylvania and to every member of Congress, requesting their aid toward defeating the bill in question."

The resolution was seconded by Dr. Benjamin Lee, who remarked: "I do not know whether all of those present understand the exact meaning of this bill or not. If it were passed by the United States Congress it would be a great misfortune. It would completely block a large range of experiments on the part of physicians who are arriving at most important results in the saving of human life and the prevention of diseases. The whole action is based upon the idea that these experiments upon the lower animals are cruel; that those who make these experiments are cold-blooded men, who make them simply for their own amusement, and that they are torturing the animals on which they experiment. Each one of these ideas is false. These experiments are made by carefully educated, trained physicians. None other are capable of making them. They are only in the interest of human life, and the great majority of them are made with the animal under the influence of anesthetics. The animal is chloroformed before the experiment is done, so that there is no suffering in connection with it. The production of diphtheria antitoxin, of which you have all heard, depends on vivisection. If we do not have the right to cultivate the antitoxin in horses, we cannot use it in human beings. If we do not have the right to test our antitoxin on guinea-pigs, then we are all at sea with regard to the strength of the antitoxin. So I would say that this measure would inflict incalculable damage on the human race, and all for the sake of a few dogs and cats. I trust, therefore, that the convention will pass this resolution as offered."

The resolution was unanimously adopted.

Dr. McFarland also read the next paper, which was by Dr. B. Meade Bolton, chief bacteriologist of the Philadelphia board of health, on "The Diagnosis of Diphtheria by Means of Cultures."

G. D. Snyder, C. E., city engineer, read the next paper—"Flood Conditions in the West Branch of the Susquehanna River."

John Fulton, C. E., engineer member of the State Board of Health, read the next—"Report on the Obstructions in the River at Williamsport." In introducing the paper, he said: "In October, 1895, the State Board requested me to come to Williamsport and make an examination of the obstructions in your river. My report was submitted at the last meeting of the Board. I found, however, that in the examination made Major Raymond, Mr. Snyder and others, they had covered the ground thoroughly, and had obtained

entirely reliable data covering the whole question. I submitted this question to the Board as very important, not only to the progress of this city, but to its condition, and I think the Board responded fully in appointing this meeting here to take up the subject face to face. Dr. Richter, who helped me make the inspection, tells me that by the vigilance of the authorities, the prompt and efficient removal of the filth deposited by floods, and the application of disinfectants you have preserved the health of your city in times of great peril and disaster. This impressed upon me the fact that if a man wants to die, he had to go somewhere else than Williamsport to do so. I am fully impressed, fellow citizens, that this improvement is imperatively demanded in view of the growth of your city. Your lumber trade is declining very fast, and I think it is very important that you make your city safe. We want to help you so that people can come here and establish new and manifold industries."

The paper was discussed by Dr. C. W. Youngman, Mr. Fulton, Dr. Lee.

The convention adjourned until 8 p. m.

At 8 p. m. the convention resumed business, and Dr. Jos McFarland, lecturer on bacteriology in the University of Pennsylvania, read a paper "Antitoxin: What It Is and What It Does for Us."

The annual address before the State Board of Health was delivered by Prof. J. T. Rothrock, State Forestry Commissioner, "The Relations of Forests to Sanitary Conditions." Illustrated with the stereopticon.

Dr. W. E. Wright, senior medical assistant, State Lunatic Hospital, read a paper, "The Causes of Insanity."

On the morning of Friday, the visiting delegation proceeded to visit the obstructions in the west branch of the Susquehanna river in reference to the resultant floods and danger to life and health.

The party met at the Updegraff House at 9 a. m., and, accompanied by a number of prominent citizens, proceeded to the dam at the foot of Hepburn street, where the great barrier, with the large pier below and the islands, piers and piles above, were viewed and discussed at length. The visitors were unanimous in the opinion that the removal of the obstructions and the widening of the bridges would greatly lessen Williamsport's liability to inundation.

The meeting was again called to order at 2 p. m.

The first paper was on the "Control of Contagious Diseases of Children," by Dr. Pemberton Dudley, President of the State Board of Health.

Dr. F. P. Ball, of Lock Haven, then read one on "Sanitary Problems in Flooded Valleys," followed by papers by Dr. J. Y. Dale, of Lemont, on "Hygiene of the Aged;" by Dr. Aug. Richter, health

officer of Williamsport and county medical inspector, "How to Secure Healthful Milk," and discussion of the same.

Then followed papers "The Sources of Water Supply and Its Pollution," by Dr. R. S. Maison, Chester; "Teaching Hygiene in the Public Schools," by Prof. W. W. Kilchner, of Williamsport;" "School Hygiene," by Dr. Louis Schneider, of Williamsport, which were then discussed.

Next followed a paper by Dr. H. H. Whitcomb, Norristown, "Personal Hygiene for Teachers," and one by Dr. G. W. Klump, Williamsport, "Hygiene of the Teeth."

At the evening session papers were read by Dr. G. G. Groff, Lewiston, "Hygienic Superstitions;" Dr. B. L. Pitfield, on "Infection and Immunity," illustrated by the stereopticon; Dr. Benjamin Lee on the "Sanitary Laws of Pennsylvania, who closed by offering a resolution as follows:

Resolved, That the thanks of the Ninth State Sanitary Convention are due, and are hereby cordially tendered to His Honor, Judge Metzger, for the able manner in which he has presided over its deliberations; to his honor the mayor, the board of health and board of trade and the health officers of Williamsport for the courtesies which they have shown and the facilities which they have furnished during the sessions, and to the representatives of the local press for their full and intelligent reports of the proceedings.

The resolution was unanimously adopted by a rising vote.

Judge Metzger addressed the convention:

"Gentlemen, I certainly feel very grateful for the high honor conferred upon me, and will say that I think, instead of any thanks being due any of the citizens of Williamsport for any courtesies to you, thanks are due from us to you for having so kindly visited us and holding your convention here. We certainly owe you a great debt of gratitude, and I am sorry that the citizens of this town did not respond better to your call and show a larger attendance. Those who did attend have been highly pleased with all that has taken place; and the papers read here certainly reflect great credit upon the participants. I can say sincerely that I have learned some things I did not know before, and have been instructed as well as pleased. In conclusion, we again thank you for your presence here."

Dr. R. S. Maison offered the following: At a meeting of the Ninth State Sanitary Convention, assembled at Williamsport, after careful conference and a personal examination of the condition of the obstructions in the west branch of the Susquehanna river at this city, and in view of the menace to the lives and health of the citizens of this large and growing city which this condition presents, it was unanimously

Resolved, That the existing condition of the obstructions appeals with great force to the Legislature of the State for aid in removing gravel bars and other obstructions from the river at this point, as well as in the work of securing the safety of the bridges under State control from disaster from future floods by affording ample room for the ready discharge of water during the flood periods.

Resolved further, That we are fully convinced that the existing condition of the river channel at this city presents an exceptional appeal for assistance from the State of Pennsylvania.

The convention then adjourned sine die.

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## THE CONTROL OF TUBERCULOSIS.

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By Lawrence F. Flick, M. D., Philadelphia.

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Government exists for the protection of the individual in those matters in which for the general good he cannot be permitted to protect himself. When immediate danger threatens, the individual may act, but for all remote dangers the government must intervene. The reason for this is self evident. If the individual were allowed to protect himself, there would be continuous warfare, and the weak would ever succumb to the strong.

So jealous has the law always been of human life, that for every danger that has arisen along new avenues of human activity, a new safe-guard has been built up. Our statute books are filled with laws protecting life and limb against accident in every walk of life and under every possible circumstance. The railroad company, the manufacturer, the merchant—in short, every employer, and indeed, the government itself, is bound to give every possible protection, and if they do not, they are mulcted in damages for loss of life or injury to limb. Even in providing for the pleasures and for the sustenance of others, we are bound by the law to protect them against injury to life, limb or health. In fact, no injury can come to a man through the application of physical force or through the taking in of deleterious substances into the system in the form of food, drink, gases or medicines against which the law has not at least attempted to set up some barrier; and yet, strange to say, almost nothing has been done to protect man against disease.

The reason for this is that governments are not yet adjusted to the newly discovered knowledge about disease. Our statute books still tacitly ascribe disease to the direct interference of an angry Providence, instead of looking upon it as a physical phenomenon subject to the control of man. We have, as yet, no adequate machinery by which legal protection can be given to man against the microscopic foes in the organic world which have been brought within range of our vision and knowledge by the modern science of microscopy and bacteriology. It takes time to create such machinery, and before it can be done in our country, where government is by the people, the whole people will have to be educated to the new way of thinking. Not only will the public mind have to be enlightened about the cause of disease, but a public sentiment will have to be created in favor of subjecting private rights to public interest, where the suppression of disease requires it, and of expending public money with sufficient liberality to accomplish the end aimed at. When the subject of prevention of diseases has once properly taken hold of the public mind, and the people have thoroughly grasped the full meaning of its theme, in the avoidance of suffering and expense, by the stamping out of such diseases as consumption, diphtheria, scarlet fever, measles, typhoid fever, whooping cough and pneumonia, there will be no difficulty in establishing a department of health, with the necessary powers and resources to accomplish the end for which it is created and free from the shackles of political slavery. It is, therefore, highly proper that an active spirited campaign of enlightenment be carried on, and that from the greatest to the humblest among us every one be made familiar with modern views about disease and how it can be controlled.

Of all diseases, the one about which we know most at the present day, from an etiological point of view, at least, is tuberculosis. From being the disease hidden in the deepest darkness, it has been brought out into the brightest light. In fact, we have now so definite a knowledge about it that it is as completely within our power as the wild beasts of the forest and the vermin of our household. Wild animals, dangerous to man, have been exterminated from the abodes of civilization, and when rats, mice, bugs or vermin of any kind infest our houses, we know how to rid ourselves of them. Science has given us the same power over the great white plague of consumption.

Consumption is produced by a little bit of organic life, which, although only visible under the higher power of the microscope, has, nevertheless, an individuality as perfect and unalterable as has the largest animal. This little member of the invisible plant world—for it is a vegetable and not an animal parasite—has existed since





the earliest records of medical knowledge, and during all that time, as is evident from the recorded descriptions of the disease which it produces, has maintained its identity through myriads of generations. It has existed during all that time, and continues to exist under definite environments, requiring a certain soil for its development, a certain temperature for its prosperity, and certain cycles of organic change for its propagation. These have all been unwittingly furnished it by the human family since the days of Hippocrates, at least, and probably since the dawn of man's day upon earth, although at any time they could have been withdrawn, as they have been by certain races and peoples, had man possessed the knowledge necessary to enable him to do it.

The microscope and the modern laboratory have enabled man to look into the hitherto unknown microscopic world and to carefully study the habits of life of this vexatious little organism, to see what it needs for its maintenance, how it gets it, why man has served so well as its host, how it can be staved out, how it can be destroyed, in short, how it can be stamped out of the world. This scientific detective work has been simpler than one would suppose. The clue to how to do it came with Koch's discovery of how to stain a microscopic organism. The scientific world was practically unanimous in its opinion that an organism existed which was the primary cause of tuberculosis. But in vain the scientist peered through his microscope; he could see nothing to which he could ascribe life or powers such as must be possessed by an organic substance capable of producing the symptoms of tuberculosis. The trouble was that he was looking right through the organism, for it was transparent. Finally, however, the genius arose who could master this difficulty, and Koch made his celebrated discovery by which he could stain these little bits of organism and make them visible. With this discovery all became easy. Being able to see the germ which produced tuberculosis it was easy to identify it, study its habits, in short, learn all about it. This has been done, and we now have even a more complete knowledge of the habits of life and the necessary environments of the tubercle bacillus than we have of many of the much larger representatives of the organic world.

The knowledge that has been gained about tuberculosis in the laboratory has been supplemented by a careful study of the disease at the bedside and in history with so striking a parallel in the logical conclusions that the truth is made to stand out all the more prominently thereby. Close observation and patient research made it possible to trace nearly every case of the disease to its source of infection, and historical study has shown its spread from country to country, and the practicability of stamping it out by appropriate

preventive efforts. Family, individual and race predisposition to the disease as revealed to the clinician, the enhancing and restraining influence of different climates upon the development of the disease, the predisposition to the disease growing out of want, depression, grief, etc., and the tendency of the spread of the disease along the lines of civilization, all fit in exactly with the knowledge that has been gained in the laboratory about the life-history of the tubercle bacillus. Indeed, every scintilla of knowledge, from whatever source derived, has helped to blazen forth the great truth that consumption is a preventable disease, and only awaits intelligent effort to be stamped out of civilization.

What is this intelligent effort? First: The civilized world must be educated to the new doctrine. Every man, woman and child must be made familiar with the fact that consumption is always contracted by contagion, and cannot be contracted in any other way. The old idea that consumption comes through a cold must be done away with, because it stands in the way of truth and leads to mischief. As long as people stick to this old error, they cannot grasp the truth, and they, to a certain degree, are led to predispose themselves to consumption by dreading and avoiding fresh air and the hardening influences of out-door life. The idea that cold leads to consumption has done more in civilized life than any other cause to prepare people for the germs of the disease.

Secondly: It must be made known to every one that the contagion of consumption resides in and is confined to the matter given off by a person suffering from some form of tuberculosis, this matter being given off either as spit or discharges from a running sore or from the bowels or kidneys. It is through this matter that in every day practical life nearly all new cases of tuberculosis are produced. The bacilli, given off in this matter, from the old host, find their way into a new host either by getting into the blood through the alimentary canal with the food, or by finding their way into the lymphatic system through the lungs, being inhaled with dust and absorbed by the bronchial lymphatics. Nine-tenths, and possibly ninety-nine-hundredths of all cases of consumption are contracted in this way. The only other way in which the disease can be contracted is by the use as food of the meat or milk products of animals suffering from the disease. In practical life, however, this is not a frequent method of getting it, for the reason that cooking destroys the germs in meat and milk of tuberculous animals, and it is not likely to be contaminated. Although I have, for years, been looking for such cases, I have not found half-a-dozen well-authenticated cases in either my own experience or in literature, which I had reason to believe were contracted by drinking tuberculous milk. And these clinical observations are entirely in harmony with laboratory

experiments, for although a few bacteriologists claim to have found tubercle bacilli in milk, the majority, and, by all odds, the most reliable, have not found them except in such cases as had the udder involved with tuberculosis disease.

Besides education, there must, however, be interference on the part of the Government. And in what should this interference consist? Studying the question from all points of view, and under the soft light of Christian charity, the most far-reaching and, at the same time, the most humane step that can be taken is the establishment of well-equipped hospitals for the treatment of those suffering from the disease—hospitals in the mountains for those in the incipient stage of the disease, and hospitals in or near large cities for those far advanced in the disease. This one step, if taken on a large enough scale, would promptly stamp out tuberculosis. In England, where private charity has for half a century prompted the establishment of large hospitals for consumption, the disease is rapidly disappearing. The method by which removal of the patient to a hospital prevents the spread of the disease is easily understood. A case of consumption may last from six weeks to ten years, during all of which time the home and environment of the consumptive, unless certain precautions are taken, become centres of infection, and all who are continuously exposed to those centres, such as members of his family, business or occupation associates and friends, are liable to contract the disease. But if the case is removed to a hospital before the breaking down which is the beginning of the infectious period, all of this danger of infecting others is avoided. The influence of such a single preventative effort is much more far-reaching than appears at first sight; for not only is the immediate infection prevented, but also those that would be propagated by subsequent cases.

As to any hardship involved in sending consumptives to hospitals, a bugbear which is being conjured up by certain well-meaning individuals who have very little practical knowledge of the subject, there can be none in practice. A well-equipped hospital in the mountains would hold out sufficient inducement in possible cure to attract all cases of incipient tuberculosis. It would not be so much a question how to force people to go to it as how to supply accommodations for those who would apply for admission. For the advanced cases, hospital treatment is so imperative for the very poor that they beg for admission into hospitals. I am constantly in contact with the consumptive poor, and I know that the majority of them will cheerfully go to a hospital if the opportunity is given them. At the present time they are denied admission to nearly all hospitals.

As yet, very little has been done by the Government in this coun-

try in the way of supplying hospital accommodations for the consumptive poor. Private charity has led the way, and various movements are on foot to give practical aid to this sadly afflicted class of sufferers, and some of them promise well for the future. Every effort should, however, be made to induce the State and City Governments to at once establish well-equipped hospitals for the consumptive poor. A fair division of the work would be for cities to establish hospitals for advanced cases, and the State hospitals for incipient cases. The Pennsylvania Society for the Prevention of Tuberculosis has had a bill with this end in view before the State Legislature for years, and is now urging Philadelphia City Councils to establish and equip a municipal hospital for advanced cases. In this effort it seeks, and should obtain, the co-operation of all individuals and organizations that have the public welfare at heart.

Next to the establishment of hospitals for the treatment of the consumptive poor the most important step for the Government to take is the registration of all cases of tuberculosis, and the proper supervision and disinfection of the environments of the consumptive. Could every case of tuberculosis be removed to a hospital, nothing more would be necessary, as the centres of infection would be removed from the community. Close confinement would not be necessary, as the education in methods of prevention which could be given in a hospital would make the patients innocuous to the public. It will, however, for a long time to come, be practically impossible to provide hospital accommodations for all cases of consumption. Until this can be done, it is the duty of the Government to give such other protection to the public as lies within its power. By registration and proper supervision and disinfection a good deal of protection could be given with the existing machinery of the law at a trifling expense. Physicians should be required to report every case of tuberculosis which has progressed to the stage of breaking down. When this stage of the disease has been reached, a diagnosis can be made with absolute certainty by a microscopic examination of the broken down tissue, so that there can be no objection to registration on the score of difficulty of diagnosis or unnecessary hardship to the patient. Prior to the stage of breaking down, there is no danger of communicating the disease to others.

When a case has been registered, if it is a person unable by reason of ignorance or poverty to protect the public, it should be visited by the health inspector, and supplied by him with the necessary germicides and paraphernalia for thorough and immediate sterilization of all tubercular matter given off, and instructed in their use. It has been said that the physician can do all this, and that a visit from the health inspector would be espionage and invasion of pri-

vate rights. But the physician does not do it, sometimes because he does not know enough about the technique, sometimes because he has not the time, and very often because there is no physician in regular attendance. Among the very poor, consumption is looked upon as necessarily a fatal disease, and when it has once passed a certain stage in its progress, the family calmly awaits death, and the physician, usually a dispensary doctor, is called in at the end to avoid a coroner's inquest. Moreover, it is not proper to place upon the physician's shoulders duties which belong to the Government. As to espionage the word cannot properly be applied to such supervision of the consumptive as is necessary for the protection of the public. The health officer need not go where, in Christian charity, he is not needed. The wealthy are abundantly able to take care of themselves. The poor are not, and it will be no hardship to them or interference with their private rights to help them to protect those near and dear to them against so fatal a disease.

In addition to education of the public, establishing hospitals for the treatment of the consumptive poor, registration of tuberculosis and supervision and disinfection of the environments of consumptives, much else could be done for the control of tuberculosis, but until these measures have all been successfully inaugurated, it is vain to speculate about others. For the present, every effort should be made to influence State and city government to take action along these lines.

As regards government control of tuberculosis among cattle, as a measure for stamping out the disease in the human family, I fear that it is much over-rated. The government of Pennsylvania has already spent much money in this direction, and from the point of view of an economical agricultural measure I think quite properly but we must not permit ourselves to be lulled into inactivity by great expectations of its accomplishing much in the way of stamping out the disease among men. It moreover looks like a hopeless task to me to try to stamp out tuberculosis among domestic animals so long as nothing is being done to prevent the spread of the disease among human beings. From my own observations and from my readings I am convinced that domestic animals are rarely a source of infection to human beings, but that man is frequently the means of conveying the disease to animals. Too much has been said in public print during recent years about the danger of contracting tuberculosis by drinking milk, and unnecessary alarm has been created and injury done by setting up a prejudice against the use of one of the most valuable articles of food. Until it can be shown that tuberculosis is contracted in this way in practical every day life, the mere theoretical possibility of its being so contracted must weigh

very little. As yet, no one has been able to point to a respectable number of cases that have been taken in this way. On the other hand, there are very few cases in human beings which cannot be traced directly to their source of infection.

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## DISEASES OF DOMESTIC ANIMALS COMMUNICABLE TO MAN .

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By Leonard Pearson, B. S., V. M. D.

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That certain diseases are transmissible from animal to man, has been known for a very long time, but it is only during recent years that comparative pathology and veterinary science have revealed the true importance of this subject. At present, we know that there are a number of diseases, that may be thus transmitted and infection may take place in a variety of ways. The most important means of communication are the following:

First.—Association with diseased animals.

Second.—Accidental inoculation with the products of diseased animals.

Third.—Consumption of the flesh and milk of diseased animals.

Of all of the diseases that belong to this category, Anthrax is probably the best known. Fortunately, Anthrax is not very common in this State, but it occurs sometimes and it is such a virulent and fatal affection, that the greatest care should be observed whenever it appears. Anthrax is interesting, historically, from the fact that it is the first disease proven to be caused by bacteria and it has received far more attention from bacteriologists, than any other malady. The spores of Anthrax bacilli are remarkably resistant organisms; they can endure the extreme changes of our climate and will live outside of the body for years. This makes the disease a particularly difficult one to eradicate and it makes it essential that all cases should be dealt with promptly and thoroughly. The germ of anthrax is found in all parts of the body of its victims, and especially, in the blood. If one makes a postmortem examination of a bullock dead of anthrax or skins an anthrax carcass, he runs a grave risk of infecting himself and, particularly, if there are any abrasions on his hands.

In many, the disease usually manifests itself as a local lesion at the seat of inoculation, known as a malignant carbuncle. I have

seen a number of cases, of this last, among veterinary surgeons, farmers and others, who have handled animals suffering from anthrax; and the medical literature is replete with instances of this nature. The malignant carbuncle makes a distressing sore that sometimes leads to general infection and death.

Anthrax is not rare among tannery workmen and wool-sorters; in these cases it is contracted by handling the products of anthrax carcasses. The ingestion of the flesh of animals that were killed while suffering with anthrax, is accompanied by extreme risk for, while the bacilli are probably killed by the gastric juice, the consumer might become infected, through sores in his mouth or the spores which are not destroyed, by the gastric juice, might cause infection through the intestines.

Since all of the domestic animals are susceptible to anthrax there is as much risk of infection, in exposing horses or sheep to diseased cattle as when a man exposes himself.

Rabies or hydrophobia is another well known disease that is transmissible from animals to man. In fact, I know of no cases of rabies in man, that were not due to infection from an animal. Although there are still a few individuals who doubt the existence of rabies, there cannot be a doubt on this question, in the mind of anyone who cares to study it carefully.

Rabies is not only an actual disease but it exists in many parts of Pennsylvania at this time. An extensive outbreak has recently been reported in Allegheny county, and a number of dogs, horses and cows have died from the disease. Some of the bitten people have submitted to treatment at the New York Pasteur Institute. There is a district near Philadelphia, where rabies seems to be stationary and very frequent outbreaks occur there; some of the cases have received careful laboratory study at the Veterinary Department, University of Pennsylvania, and in this way the diagnosis has been proven.

Glanders is primarily, a disease of horses, but it may be communicated to dogs, cats and men. The virulent character of glanders is so generally recognized that owners of glandered horses do not long hesitate to destroy them; so when the disease is recognized the subject does not, as a rule, remain alive to disseminate it. However, there are some unscrupulous persons who sell horses, of this sort, and they pass from owner to owner infecting additional horses in every stable they occupy. Men are usually infected by receiving the discharges, of a glandered horse, in their faces or upon an abraded skin. The disease is very virulent and incurable in both men and animals.

Tuberculosis of cattle is a disease that has received a vast amount of attention during the past few years and the public is pretty gener-

ally aroused to the dangers of consuming the flesh and milk of tuberculous cows; it has been shown by numerous investigations that the milk of tuberculous cows may contain the bacilli of tuberculosis. This is always the case when the udder is tuberculous and may be the case, in some instances, when the disease is confined to organs other than the udder; and, as has well been brought out in the recent report of the Royal Commission of Tuberculosis, if the udder is healthy in a tuberculosis cow, it may become invaded in an almost incredibly short time and thus the milk may, at once, become very dangerous. Hence all tuberculous cows should be looked upon with suspicion and unless their products are sterilized, by heat, they should be excluded from human consumption. The danger that attends the use of milk, from a tuberculous herd is well known to veterinarians, through the frequent appearance of intestinal tuberculosis in calves and swine fed upon it.

Actinomycosis is caused by the same parasite in both men and animals and there are some who hold that this disease may be contracted by consuming the flesh of actinomycotic cattle; although this theory is not fully established, we should follow a safe course and refuse to allow the sale of the flesh of cattle suffering with this disease.

Diphtheria was formerly thought to be a common disease of the lower animals, but since the discovery of the bacillus of this affection and the employment of accurate means for its recognition, it has been found that the old view was erroneous. However, there are a number of more or less perfectly demonstrated cases on record which tend to show, that in some instances, at least, animals have contracted true diphtheria. A case was recently reported by Dr. A. S. Wheeler, of New Orleans, in which a dog died of diphtheria and the diagnosis was proven by the bacteriologist of the New Orleans Board of Health.

Fowls are supposed, in some cases, to suffer from true diphtheria; at all events, much care should be used in treating animals with symptoms resembling diphtheria and they should not be taken into houses and allowed, to associate with children, as is so frequently done.

There are a large number of parasitic diseases both animal and vegetable, that may be transmitted from animals to men, that are so well known that it is only necessary to name them. The most important are tape worms, from hogs and from cattle, trichinae, favus and ring worm.

There are some conditions of animals that lead to the production of certain toxic compounds in the flesh and milk, which poison consumers, but do not cause the same disease from which the animal suffered. In most cases of high fever, the flesh and milk undergo



certain changes or receive additions of certain substances that are very deleterious and sometimes fatal to the consumer. Many of these evils can be avoided by a systematic inspection of slaughter houses and food animals and of dairies.

Such inspections are desirable from the standpoint of public health, but they would, also, be found to be of great benefit to farmers, because they would restore public confidence in the products of the dairy, which, of late, has been so rudely shaken, and thus enlarge and improve the market.

The State Live Stock Sanitary Board is actively engaged in combating the infectious diseases of animals, and is making some progress in the direction above indicated; but, as yet, it has not attempted a systematic inspection of the dairy cattle of the State.

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#### THE DIAGNOSIS OF DIPHTHERIA BY MEANS OF CULTURES (SYNOPSIS FROM THE FIRST ANNUAL REPORT OF THE BACTERIOLOGICAL DIVISION).

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By B. Meade Bolton, M. D., Chief, Bacteriological Division, Board of Health of Philadelphia, and Herbert D. Pease, M. D., First Assistant:

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Mr. President and Gentlemen: We are conscious that statistics and deductions published by laboratories of boards of health, have been subjected to unfavorable comment. Recognizing the justice of much of this criticism, we have tried to avoid falling into the errors that have been pointed out, and we think our results have thrown some light upon various points in relation to bacteriological investigation of diphtheria.

It is clearly unjustifiable to regard all the cultures sent to the public laboratory as cultures from cases of diphtheria. In many cases, the physicians who send the cultures are themselves in doubt, there being often only questionable clinical signs of the disease. In many cases also the physicians do not regard the case as diphtheria.

In making up statistics and drawing deductions, the three classes of cases should be treated separately. Owing to the neglect to do this, the value of the bacteriological tests has been called in question by clinicians, for they argue rightly, that a large experience enables them to make a correct diagnosis much oftener than one would suppose from the statistics of public laboratories where all culture in-

discriminately are assumed to be from cases of clinical diphtheria. To illustrate this point, take the experience in the laboratory here. In the first seven months from May 30, 1895, to January 1, 1896, 3,363 cultures in all were examined. Of this number 1,241 were primary and 1,942 were subsequent examinations. If we take the 1,421 primary examinations we find that of this number 214 were made from the throats of healthy persons who had been exposed to the disease, but who had no clinical symptoms, and no clinical diagnosis was given in 502 cases. Of all 1,421 cases the diphtheria bacilli were found in only 864 or 60 per cent. This would mean that the physicians or the bacteriologists had made an error in 40 per cent. of the cases. The cause of this discrepancy is apparent. Of course, those cases showing no clinical signs should be subtracted, and the cases from the throats of persons merely exposed should be also excluded. In order to compare the correspondence between the clinical diagnosis of diphtheria and the results of bacteriological examination, it is evident that only the cases reported as diphtheria by the physicians should be taken. Of these there were 557 cases, and the bacilli were found in 502 or 90.2 per cent. It is to be expected that the correspondence would not be absolute, for on the one hand it is well known that in some cases non-diphtheritic anginae simulate diphtheria so closely that the clinical diagnosis cannot be made; on the other hand, it may happen that it is impossible to obtain cultures uncontaminated with micro-organisms which mask the growth of the diphtheria bacilli. This is, however, less often the case than would be supposed.

If we take the cases in which the physicians made the diagnosis of "not diphtheria" it is found that the correspondence between the clinical diagnosis and the bacteriological examination is not as close as where the diagnosis of "diphtheria" was made. In other words the physician is oftener in errors when he thinks the case is not diphtheria, than where he thinks it is. There are a great many cases of diphtheria that present such mild symptoms that the physician is often deceived, and yet these cases are capable of spreading a virulent epidemic. It has been abundantly proven by animal experiment that the bacilli may have full virulence in the throats of persons presenting little or no clinical evidence of disease. Of 148 cases sent to the laboratory with the diagnosis of "not diphtheria" forty or 27.1 per cent. showed that the bacilli were present. It is evident that the bacteriological examination is of the first importance in these cases not only on account of the person having the organism in his throat but especially on account of the persons around.

In 502 cases the physicians sending in cultures did not venture on a diagnosis either as to whether the case was or was not diphtheria. Out of this number (502) the bacteriological examination

showed the presence of diphtheria bacilli in 253 cases and absent in 126 cases.

Cultures were sent from the throats of 214 persons who had no clinical evidence of disease, but who had been exposed to contagion. Of these 214 cases the bacilli were found in eighty-nine or 41.5 per cent., persisting for minimum three days, maximum thirty-six days.

The length of time that the diphtheria bacilli persist in the throat is also a matter of interest. The average length of time in the 460 cases in which this could be determined was 28.3 days, minimum seven days, maximum ninety-six days. On the 211 cases in private practice where there were clinical symptoms of the disease the bacilli persisted 23.6 days from the appearance of the first symptoms. In the fifty cases in private practice where there were no clinical symptoms the average duration of the organism was 13.3 days from the first positive to the first negative culture.

Besides the cultures from the throats the diphtheria bacilli were found to be present in all of five cases of membranous rhinitis. In three cultures from the nose in which no diagnosis was made clinically, the diphtheria bacilli were found in one. The bacilli were present in a case of oral discharge and in an operation for circumcision and in a case of empyema. In the case of circumcision the boy had diphtheria in the fauces. Diphtheria bacilli were also found in a bruised knee and in four out of six cases where the diagnosis of scarlatina was made.

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### THE HYGIENE OF OLD AGE.

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By J. Y. Dale, M. D., Lemont, Centre County, Pa.

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Hygiene for the aged means that which will best conserve the health of those who have passed the active stage of middle life, or that which will tend to longevity.

It must not be supposed that the hygiene of old age differs essentially from that of other periods of life, though it is true that it needs to be modified in some particulars to meet the changed requirements that confront us, when after a more or less prolonged existence, vitality is on the wane. On an occasion like the present, it is manifestly impossible with the short time at our disposal, to do more than touch upon the most salient and practical aspects of the subject.

On old age there is a tendency to approach the conditions of infancy, and the popular saying that man is twice a child reflects this

Y. Y. Dale

view. To a limited extent there is a physiological basis for such an opinion, and as a corollary, there is a certain similarity in the hygiene for the two extremes of life. If the education of a child should antedate its birth, it is equally desirable that the hygienic management of old age should begin long before that time of life is reached. In matters pertaining to hygiene we cannot follow the scriptural injunction to take no thought for the morrow, but on the contrary to-day must always be lived with strict reference to the influence it may have on all of the other days to come.

Medical science has done much for the alleviation and cure of disease and suffering, but it is to preventive medicine that we must look in the future for the accomplishment of the greatest good to humanity. When our knowledge of the laws of health and of the causes of disease is so advanced that we can acquaint ourselves with the proper methods to pursue in avoiding sickness of all kinds, and for keeping the complicated mechanism of our systems running in such a way as to reduce wear and tear to a minimum—then excepting for accidents or hereditary influences, each individual might live, until from long continued use, every part of the body was as completely worn out as the deacon's one horse shay.

Not only is the average duration of life steadily increasing, but the strength and ability to work to an advanced age is more general now than it was several hundred years ago. The economic value to the state of an individual who is capable of doing good honest work of any kind is very great, and the addition of several years to the productive period of life would be a corresponding gain to the body-politic. The length of human life has not yet reached its natural limit. In all vertebrates the physiological duration of life is five times as long as the period required to reach maturity. The horse, for example, attains his growth in five years, from which it follows that twenty-five years should be the usual term of his existence; but we all know that horses not infrequently live to the age of thirty and even forty. In the human animal, adult life is not reached until the age of twenty or more years, consequently man should live at least a hundred years, and extreme old age should be from twenty to fifty years longer. Delicate health by no means precludes the possibility of a long and useful life, and a very large proportion of the work of the world is done by semi-invalids. Dr. Oliver Wendell Holmes says that one of the necessary requisites for attaining longevity is to be rejected for life insurance by a first class company.

The battle is not always to the strong nor the race to the swift. It is not natural that this should be so, and the explanation is not far to seek. The valetudinarian, if he wishes to live in comfort, is compelled to exercise the greatest possible care in his conduct of life. The strong and healthy man on the contrary ~~imagines~~ that he can

endure anything, and pays no attention to the commencing symptoms of acute disease, or to the first warning signs of breaking down health—the natural result is that when he does give up, it is often too late for his life to be saved. How frequently do we see the most vigorous man succumb to an attack of serious illness from which the weakling will recover. In apportioning their various gifts to mortals, this is one of the compensations that the gods award to those who are less robust than their fellows.

Age cannot always be computed by years, chronologically the individual may be young when physiologically he is old, and vice versa. Some one has said that a man is as old as his arteries, and from this point of view some portions of the body may be old while others are still young. When any of the arteries lose their elasticity through degenerative changes, so that they no longer supply blood in more or less quantities according to the needs of some special organ, then this organ must suffer and lose in strength and vitality, or grow old. If the arteries of the brain get hard and brittle, an unusual blood pressure in them may induce a rupture, and the blood that escapes, compressing a portion of the brain, causes paralysis. When the arteries of the temple or wrist get hard like a whip-cord, a man should call a halt—the machinery of his body has been running at a too high rate of speed, too much steam is being generated, and if the safety valve is not opened, or less fuel burned, the result will inevitably be an explosion; in other words, his mental or physical exertion must be moderated, his diet made less stimulating, and excesses of all kinds avoided.

There is a great deal of nonsense written about people leading natural lives, by which, however, can hardly be meant a return to the primitive moods of the savage. It is no doubt true that civilization brings in its train many evils, but they are greatly over-balanced by its advantages and benefits. The more wants a man has that are not wrong or hurtful in themselves, and the better able he is to supply them, always promising that they are subordinated to the known rules of health, the more his comfort, happiness and chances for long life will be increased. Compare a well-to-do man at the close of this century with one who lives in a so-called state of nature, and see the vast difference between them in every respect—physically, mentally and morally. The necessities, comforts, and luxuries, with which a well paid laboring man can now surround himself, far exceed those which even English royalty was accustomed to several centuries ago. The distim of the poet that

"Man wants but little here below,  
Nor wants that little long."

might be paraphrased thus—

Man wants a great deal here below,  
And wants that great deal long.

It is too much the fashion now-a-days for writers in both the medical and lay press to attribute almost every form of ill health to microbic action, but it must be forgotten that the greatest foe to all kinds of poisonous bacteria and germs, or other disease producing agents, is good health. Under ordinary circumstances the white corpuscles in healthy blood are capable of destroying all sorts of disease bearing germs. If this were not the case the world would soon be depopulated, because we are all constantly inhaling them with our breath or swallowing them with our food and drink, without much inconvenience. Bacteria may often be the exciting cause of disease, but much more important to prevent are the predisposing causes, or those that lower the tone of the system and render us easy victims to the invasion of these minute organisms, or to the effects of any other exciting cause.

The best safeguard against any of the causes of disease is to preserve our bodies in a state of health, and there can be no doubt that the only way to accomplish this is to observe the laws of hygiene. Whatever is capable of affecting the health of individuals or communities pertains to the art of hygiene, such as the soil we live on, air, water, food, warmth, light, dwellings, dress, habits and occupation—in fact all our natural surroundings social conditions, or hereditary tendencies.

All of these things apply to the different periods of life, but there are some of them which need special consideration in their bearing on the health of old age. Congenial employment and sufficient rest are important. Sleeplessness is unfortunately a frequent concomitant of advancing years, but this can usually be relieved by appropriate remedies. Old people, like infants, require a great deal of warmth, and in their efforts to keep cold air out of their apartments and to avoid drafts they are very likely to neglect ventilation and to breathe an impure atmosphere. It might be remarked in passing that with all our boasted progress the proper economical ventilation of houses is an art in which but little improvement has been made over the methods of the ancients.

The selection of a proper dietary for elderly persons is a matter of considerable difficulty, because in many respects it should differ materially from that which is suitable to the periods of growth and maturity. Food is of such vast importance in its influence on our bodily conditions, that some writers have reduced hygiene to a system of dietetics alone. Our comfort as well as our health depends in a great measure upon what we eat. Byron says:

"Man's happiness—the hungry sinner—  
Since Eve ate apples, much depends on dinner."

It does not come within the scope of this paper to do more than indicate a few broad dietetic principles; in fact it is not practicable

to formulate rules that will apply to the generality of people. The kind, quality and quantity of food, and the frequency with which it should be taken, can be directed for each one only after precise knowledge of the state of health, habits of life, nature of work and personal characteristics of the individual. Climate, age, race, occupation, environment, and idiosyncrasy are all factors that must be considered. The dweller in the frigid zone, and the tender infant the world over, require an almost exclusive animal diet—whereas the inhabitants of the equatorial regions are best nourished by fruits and vegetables, and need but little flesh. From the beef-eating Englishman to the rice-eating Oriental there are all gradations. We should consume less meat in summer than in winter, and children and the aged ought to eat comparatively little of it. "What is one man's meat is another man's poison," is as true as adages generally are. Because certain viands suit one man's palate and stomach is no reason for advising all other persons to use them. There is as much difference in the digestive organs of individuals as there is in their personal appearances. Nature has supplied with a bounteous hand products of all kinds for man's consumption, but owing to ignorance, superstition and prejudice, a great deal of the material available for conversion into wholesome and palatable food is not made use of.

In health, as a general rule, all persons are better in every respect without the habitual use of alcohol; but great as is the harm resulting from indulgence in alcoholic drinks, it is probably small when compared with the damage done by improper eating. Every man does not drink alcoholic beverages, but every man must eat to live, and it is, perhaps, no exaggeration to say that at least one-half of the disease that affects humanity in adult life, is brought about by avoidable errors in diet. Over or improper eating is so common as to be almost universal. Either the food is too great in quantity, too rich in quality, unwholesome in itself, or badly prepared. An individual who has a perfect digestion, is exceedingly rare.

A young and healthy person with a vigorous digestion can habitually consume much more food than is needed to supply the wants of the body. The eliminative processes being very active in youth, help to rid the system of the excess, and if it cannot all be disposed of in this manner, a so-called "bilious attack" occasionally comes to the aid of the over-taxed organs, and no apparent harm is done. If one does not learn by experience that it is unsafe to continue taking more food than is necessary to supply the expenditure of force required to carry on the functions of life and to supply the waste of the tissues, the time will come, say about the age of forty or fifty, when an elimination becomes more sluggish, the surplus material will be partly stored away on the surface or in the cavities of the body in the form of fat. Other portions of it may over-stimulate

some important organs, as the liver and kidneys, or produce gout, rheumatism, degenerative changes in the blood-vessel system, or in a dozen other ways induce disturbance in the economy, causing unhappiness, suffering and disease, thereby lessening the power to enjoy the use of body and mind, and necessarily shortening life. When an individual steadily takes on fat, it is a warning that among other things, the diet must be modified. It is fallacious to believe that increase of girth means increase of health and strength. To be reasonably energetic bodily and mentally, an old person of eighty or ninety ought to be spare and of light weight. None of the organs can act in a normal manner if burdened with fat.

As a man grows older and less active, he requires a smaller amount of food because his expenditure of force has decreased. Having no longer the powerful digestion and prompt elimination of former years, any surplus nutriment cannot easily be disposed of. The only time, if ever, in his whole career that a man occasionally indulge in excesses of any kind with impunity, is during the full vigor of youth or early middle life. The diet should become more simple as age advances, and in quality should approximate that of childhood. It is by no means necessary for elderly persons to be so ascetic in their habits as to deny themselves altogether the pleasures of the table; but plain living and high thinking should be the delight of old age. The Apostle Paul says: "Let your moderation be known unto all men," and this is excellent advice to follow under any of the changing circumstances of life.

According to the regulations of the United States Army, an officer is retired from active service at the age of sixty-four. Army officers are always picked men, and at this period of life if they have lived temperately they should still retain their capacity for many years of good work.

If this rule were universally applied to government employees and officials, it would deprive the world of its most eminent leaders and statesmen. Cicero says: "Thought and understanding and counsel are the endowments of the old, and without these no state can stand." Gladstone and Bismark are both octogenarians, and the Queen of England is hale and hearty at seventy-seven. Bismark is a living example of the value of a carefully regulated diet, wisely selected to suit the requirements of an individual. Some years ago, this celebrated man, who practically ruled the German Empire, also dictated to his physicians instead of being governed by them. The result was that his herculean frame became loaded down with fat, which interfered with his vital functions, and in addition he was threatened with such serious disease that he apparently had but a short time to live. When he first consulted his present physician, that astute man positively refused to prescribe unless his distin-



guished patient agreed to follow his directions implicitly. It is said that at first Bismarck submitted with a very bad grace, but he soon saw the advantage of this course by a marked improvement in his health and strength. If his previous life had been lived in accordance with the laws of hygiene, he might still have many more years of usefulness before him. His Holiness, Pope Leo the Thirteenth, who was born in 1810, bids fair to become a centenarian. The physician in attendance upon him reported last winter that his illustrious patient was in good health, and that he adhered strictly to any advice given him. He eats sparingly four times a day, taking a cup of bouillion or a little meat, and drinks a small glass of claret with his meals.

A beautiful example of hardy old age is furnished by Adam in "As You Like It," who says:

"Though I look old, yet I am strong and lusty ;  
For in my youth I never did apply  
Hot and rebellious liquors in my blood,  
Nor did not with unbashful forehead woo,  
The means of weakness and debility,  
Therefore my age is as a lusty winter,  
Frosty, but kindly."

The passion of earlier life should find no place in the serenity of old age. To grow old gracefully and cheerfully is an art that is well worth cultivating by all those whose fortune it is to live on into the sere and yellow leaf, and it is a theme that has engaged the minds of philosophers and sages in all times. Mere length of days in itself is not desirable unless it is attended by the ability to enjoy existence. An honorable old age, instead of being a burden to its possessor, should have many compensations and pleasures, if the laws of nature have been obeyed from youth upward. Divine favor is not withdrawn from the aged even though "they whom the gods love die young." Heaven should lie about us in our second childhood as well as in our infancy. No fate can be happier than for a man to have so ordered his course of life, that in the evening of his days he may be blessed with a fair measure of bodily and mental vigor:

"And that which should accompany old age,  
As honor, love, obedience, troops of friends."

## HOW DISEASES ARE CONTRACTED AT SCHOOL.

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By Louis Schneider, M. D., Williamsport.

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In the whole domain of school hygiene the most difficult task to accomplish is the successful prevention of the introduction and spread of contagious and infectious diseases among pupils. It is very easy to formulate and enforce rules and regulations excluding those known to be so afflicted or belonging to families in which such diseases exist, until they bring from the attending physician the required certificate which states that they "can be re-admitted to school without danger of conveying contagious disease."

Apparently the strict enforcement of such rules would remove all possible danger, but unfortunately some of these diseases often occur in such mild forms that they escape the vigilance or observation of the parents and the teachers, and do not make the child sick enough to keep it away from school for the first few days. It mingles on the play-grounds in games which bring it in very close contact with and sits in classes beside the other pupils until it becomes too ill to longer attend, and by that time the mischief is done—an epidemic breaks out in that school.

When we physicians are called to see a case of scarlatina, roseola, rubella, mumps, whooping-cough, diphtheria or follicular tonsillitis occurring during a school term, nine times out of ten, the patient on close questioning and often voluntarily gives a detailed history of Johnny Doe or Sally Roe attending the same school with a rash, a sore throat, or a bad cough, and with whom hands had been joined in innocent play or in climbing the rugged hill of science.

Then if we happen to be school directors also, the parents propound some questions which to the ordinary every-day layman might be very embarrassing and probably self-implicating to answer. We are either accused of being remiss in our duty as directors in not exacting the enforcement by the teachers of the rules which exclude pupils afflicted with contagious diseases from the school, or as physicians are suspected of tolerating the disobedience of the aforesaid rules for the enhancement of our own individual good. Somehow they get the idea that that which is our good is not always *pro bono publico*.

If we succeed in exculpating ourselves and all the other members of the board of education, the poor teachers who are blamed with everything that goes wrong with the pupils on the way to and from

and at school, come in for their share of animadversion. They are not to be blamed either for they rigidly enforce the rules in all cases. Who, then, is at fault? How does it come that the infection or contact can nearly always be traced to the school-mate of the patient? Two questions which it is the purpose of this paper to answer.

The fault very often lies with the indifferent careless parents who allow or compel their sick children to go to school. They seem to think that when their children are at school they know exactly where they are, and because they pay school tax they want to get the worth of their money.

Children are not allowed to complain of feeling sick and often are suspected of malingering. That mysterious periodical headache which spontaneously disappears at 9.30 a. m. and 2.30 p. m. has taught many a mother that her beloved child has taken two or three bites of the fruit of the tree of the knowledge of good and evil (or words to that effect).

When children say they are sick they should be taken under close observation, and if they really are sick, be not sent to school. An apparently trifling indisposition may be the forerunner of a dangerous malady, and the sooner such a case is taken in hand and properly cared for—all things being equal—the better the result.

Sore throat may be simply due to cold or it may be the commencement of diphtheria or follicular tonsillitis, and he is a very wise physician indeed who for a certainty can tell which it will be if he sees it early in the attack. "When doctors disagree" who knows? How puzzling is the differential diagnosis of scarlet and rose rash in many cases! Many children go to school with all the symptoms of a "bad cold in the head," and on the fourth day of their punctual attendance "break out" with measles in full bloom, and then after that "there are others."

Another child struggling hard to get its name on the roll of honor attends with an obstinate cough for two or three weeks, and then begins to whoop. If the teacher's suspicions are not aroused in time and that particular child sent home with strict orders to remain there until recovery ensues, all the pupils will have whooping-cough, and that school will be closed for quite a while.

Strange to say, many people have no faith in physicians and their medicines. They know or have been told that some of these diseases are self limited and that the patients will manage to get well if they are not doctored too much. In mild cases this plan does not work to a charm it must be admitted. If a doctor be sent for he placards the house for every sore throat and every rash.

How utterly impossible it is to pound it into the heads of the otherwise apparently intelligent layman or laywoman that scarlet rash is nothing less than that much dreaded disease in a mild form, but equally as powerful for evil to others who come in contact with it.

A placard on a house causes the Levite and all others to go by on the other side of the street. News and valuable information from all the outside world is thus shut off, for the neighbors are afraid to bring any in, or if they have the courage to break through the cordon of the quarantine, it is too often for the purpose of finding out for themselves whether the diagnosis be correct and the treatment proper, or for the recommendation of some nostrum. Then, also, the health officer comes nosing around to see if he can find the *fons et roigo mali*, and this is a very offensive and annoying procedure to every housewife, be she scrupulously cleanly or very dirty.

For these and other reasons some people will not call in physicians; will try to get along without one and allow the remaining children of the family to go to school until they in turn are attacked. In the meantime germs of disease have been sown broadcast among pupils by means of infected clothing or by actual contact.

I have heard people make use of an expression like this: "We have been there; let the rest take care of themselves,"—certainly not a very humanitarian frame of mind to be in. Another class of propagators of infections and contagions are the poor, who think that they cannot afford to send for a physician for every sore throat or eruption that may show itself in their families. They trust to home remedies and Nature's spontaneous cures, and when they think their children are well enough to go back to school, back they send them covered with the scales of scarlet fever (or only scarlet rash) and measles, or with throats and nostrils laden with bacilli. What is the result? More cases of scarlet fever and diphtheria.

Because they had no physician they have no required certificate to hand the teacher if one be demanded. In some cases children are instructed by their parents not to tell how they were sick or what ailed them. What shall the teacher do? Of course, if there remain marked evidences of such diseases, that child must be sent home—after it has contributed some germs of a fatal malady to several little friends.

On or about the first day of next September the strong arm of the law will be laid on the shoulder of the small boy who does not attend school, and he will go *nolens volens*. The first question asked of him will be, "Are you vaccinated?" Quite likely he never has been, then he will get a reprieve until he has undergone the operation. Probably his parents are too poor to have him vaccinated or do not believe in it. Then comes up the question of compulsory vaccination which was legally decided for the first time in this Commonwealth by the learned gentleman who presides over the deliberations of this body. Parenthetically let me say that we members of the board of education had a hard fight, but we won, thanks to Judge Metzger and the Supreme Court of Pennsylvania.

How many times the above-mentioned small boy will be arrested before he is vaccinated and legally enrolled in his school the writer cannot say.

The danger of the introduction of infectious and contagious diseases into the schools will be greatly increased by the enforcement of this self same law. These pupils will come from families of the poor who needed them for bread winners and who were not in the habit of sending for a physician every time a child had a sore throat or a rash. Others will come from the criminal classes who are not noted for their love of offspring, or their extra good care of them when ill; consequence, more diphtheria, scarlet fever, etc., in the schools.

It seems to me that there will be many conferences in the near future between the truant officer, the health officer and hygienic committee of the board of education.

What shall be done is a question which the writer asks to bring up a discussion, or, in other words, how shall we successfully prevent the introduction and spread of infectious and contagious diseases among the pupils of our public schools?

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### THE DIPHTHERIA SERUM.

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By Joseph McFarland, M. D., Lecturer on Bacteriology, University of Pennsylvania.

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A decade ago the assertion that Nature caused the organs to accommodate themselves to the action of physiological poisons, by the formation of antidotes, would have met with very cool reception; but since the researches of Behring, Ehrlich, Kitasato and others, scarcely any biological fact has been more clearly demonstrated than that in animals artificially and progressively immunized to certain poisons, antidotal substances called antitoxins, are produced.

Though originally discovered for bacterial poisons, the production of antitoxins is by no means restricted to poisons of this class. The classical experiments of Ehrlich have shown us that ricin, the alkaloid of the castor-oil bean, and abrin, the alkaloid of the jequirity bean, are combated by anti-ricin and anti-abrin.

Calmette and Fraser have demonstrated the existence of anti-venene, by which the poisons of the cobra and rattlesnake are combated, and while it has not yet been experimentally demonstrated,

the reasons for believing that alkaloidal poisons have their effects in like manner annulled, become every day more numerous. The antitoxins, using this term in a general sense applicable to all of these bodies, are of rather obscure origin.

Two theories at least have been suggested to explain their formation. The first, which seems to have met with more favor, is that the antitoxin is the toxin in an altered condition. The second, that the antitoxin is a product of the tissue cells and proteid substances, whose formation depends upon the stimulation of the cells of the body, by the poisons they have received. Let us consider for a moment the evidence in support of the first of these theories.

First. The poison, at least in the case of the diphtheria toxin, seems to be retained in the animal body, and not eliminated from it. Experimental evidence to show that diphtheria toxin is not eliminated through the kidneys is interesting. Repeated injections of the urine of horses immunized to diphtheria, and in consequence of their immunization able to withstand one hundred times the ordinarily fatal dose, into guinea pigs, seems to be without any more serious consequences than the injection of normal urine. One horse after having received an injection of 200 cc. of strong toxin was catheterized one hour afterward, and three guinea pigs weighing on the average 550 grammes, injected with one, two and three cc. respectively, not one of the animals showed the least inconvenience from the injection. It sometimes happens that after receiving these large injections of toxin the horses sweat very freely, and are sometimes seized with attacks of diarrhoea, both of which might be regarded as efforts at elimination, but so far no one has been able to show that in the excretions any toxic substance is present in an appreciable amount.

Second. The antitoxins can be manufactured artificially outside of the animal body. The experiments of Smirnow (Berlin Klin. Wochens, 1895, Nos. 30 and 31) show that by electrolysis in a U-shaped tube the diphtheria toxin can be robbed of its toxic qualities, and so changed that instead of exerting a deleterious influence upon the guinea pigs when introduced into them, it exerts an actually protective influence over the unchanged toxin. It is true that the antitoxins artificially prepared in this way are exceedingly weak; Smirnow found that from six to eight c.c. of the artificial antitoxin were required to accomplish the result brought about by the 1/100 c.c. of serum from an animal properly immunized to the diseases.

Third. The antitoxins in their antidotal influence over the toxins, exert this influence in definite mathematical proportions. Having discovered that an antitoxin is potent against a definite quantity of toxin, it can be demonstrated with the greatest ease that twice the amount of antitoxin is potent against twice the amount of toxin;

that five times the amount of toxin, and that even ten times the amount of antitoxin will successfully combat ten times the original amount of toxin. In this way, in experiments which I have performed, I have succeeded by the proper admixture of toxin and antitoxin in saving the life of a guinea pig from the toxic action of one hundred times the amount of diphtheria toxin that would certainly have killed it.

The evidence that can be brought forward for the support of the second theory is really very small indeed. It is chiefly based upon the observation that the employment of antitoxin in human medicine is not infrequently followed by disappointments. These disappointments, we are told, must be due to the fact that the tissue cells, by which the antitoxin is produced, could not be sufficiently stimulated to produce enough antitoxin to counteract the poison. In connection with human medicine, however, several very important considerations present themselves. We are never able to estimate with the slightest accuracy whether the patient has much or little toxin circulating in his blood; therefore, we as often give too little of the remedy as enough, or too much. In human medicine we constantly combat infection plus intoxication, this combination being one which makes the enemy's force inestimable.

We have already described the antitoxin as a proteid substance. According to the researches of Tizzoni, it is a globulin, not a toxalbumen. The recent researches of Brieger and Boer (*Zeitschrift fur Hygiene*, 1896) show that the antitoxin can be extracted from serum containing it by precipitation with a solution of the heavy metals, and consequent purification by the passage through the dissolved precipitate of carbon dioxide gas, etc., and in the pure form appears as a white powder freely soluble in water.

It seems to be by the formation of antitoxins in the blood, that the individual suffering from diphtheria recovers. The researches of Abel (*Deutsche Medicinische Wochenschrift*, 1894, Nos. 48 and 50) show that in the blood serum of diphtheria convalescents antitoxin is present. The experiments of Fischl and Wundschheim (*Zeitschrift fur Heilkunde*, 1895, Vol. 16, pp. 429, 482) seem to indicate that the immunity possessed by new-born babies depends upon the presence of antitoxic substances (protective substances) in their blood. The antitoxins, however, are not the substances upon which the natural immunity depends. Natural immunity depends upon the presence of the alexins described by Buchner. And in the blood of naturally immune animals no antitoxin exists, as Kuprianow has shown by experiments performed with the blood serum of the rat, one of the most immune animals. The difference between alexins and antitoxins is considerable. The alexins are delicately organized compounds of proteid nature, which are destroyed by the influence

of light, and very moderate degrees of heat (50 to 55° C.). They are also destroyed by a very low temperature, and putrefaction of fluids containing them.

The antitoxins on the other hand resist all these conditions with ease. They are not destroyed by heat up to 70° C., can be frozen with impunity, and resist the action of light for a considerable time. I have found putrid antitoxic serum as active as fresh blood serum, and have found specimens preserved in the laboratory for a year to be unaltered by time. Curiously enough, the immunity of the animal furnishing the antitoxin does not seem to depend upon the presence of the new substance which it creates. It seems quite possible for animals to possess a very high degree of antitoxicity, and at the same time be hypersensitive to the action of the poison. Behring discovered this to be particularly true of tetanus. In his experiments he found that one horse furnishing strong antitoxin suddenly succumbed to a small dose of the toxin. I have seen the same thing, and one of our horses succumbed to diphtheria toxemia at the very time that his serum contained 700 units per cubic centimetre—strongest serum of which I have any knowledge. If the theory that the antitoxin is a toxin in an altered condition be correct, we can readily understand that the presence of the changed toxin in the blood does not alter the condition of the animal in whose blood it occurs, and that the immunity which the animal has acquired depends upon something else than the presence of an oxidized (?) or otherwise chemically altered foreign substance within it. The antitoxins exert no specific influence upon the bacteria producing the poisons that they combat. They are not germicidal, excepting in the case of cholera and typhoid fever serums, and, indeed, it is a question whether it is proper to speak of these germicidal serums as antitoxic serums at all.

The method by which the antitoxin is prepared is now well known, and has been made the subject of numerous exhaustive treatises. A strong toxin is prepared, and introduced into a suitable animal in gradually increasing amounts, until the blood is found by experiment to possess the desired quantity of the antitoxin; after which the animal is bled, the blood allowed to coagulate, and the clear serum in which the antitoxin is in solution, is pipetted off.

More attention seems to have been devoted by the workers in the United States to the methods of making the antitoxin than to the methods of determining its value after it is obtained. No product can be useful whose exact value is not known. By this I do not mean that in order to cure diphtheria one is obliged to have an exact knowledge of immunizing units administered to his patient. It is, however, necessary in order that the results of the use of antitoxin in the treatment of diphtheria especially can be accurately estimated, that the treatment of the cases be as uniform as possible, and that



definite amounts of serum, whose strength is accurately determined, be used.

Two methods of testing antitoxin have been suggested. The first, which, in my opinion, is far inferior to the second, depends upon protection against the action of living bacteria. The least certainly fatal dose of a live culture of a certain age is administered to an animal, together with enough antitoxin to save the animal's life. This is the French system. It is at once evident that the result of such a test will be more or less marred by the rather capricious behavior of the live bacteria. It is also a troublesome method, as one must have constantly on hand pure cultures of known age and virulence from which dilutions of the bacteria can be made.

Much more exact is the method suggested by Behring, in which the antitoxin is made to combat not the live bacteria, but the sterile toxic product. In order to test by Behring's method, one requires to have on hand a toxin whose strength is accurately known. By injection into a considerable number of guinea pigs, one must be definitely informed that a certain amount per body weight of guinea pig will prove fatal in nine cases out of ten. This least certainly fatal amount is spoken of as a minimum fatal dose. The guinea pig may die from the action of such a dose in three days, in four days, sometimes in six or seven days, and occasionally not for nine or ten days. As it would be very difficult to estimate accurately the advantage of antitoxin administered in combination with a single minimum fatal dose, Behring established a standard test by which the antitoxin is made to combat ten times the minimum fatal dose of antitoxin.

As there are two systems by which the antitoxins are tested, so there are also two systems of nomenclature; and while in my judgment the French system of testing is inferior to the German system, the French system of nomenclature or strength denomination depending upon the relative proportion of antitoxin to the body weight of the guinea pig, is far superior to the German system of Behring, in which the strength of the antitoxin is expressed in so-called immunizing units.

According to the French system, an antitoxin is described as one to fifty thousand, one to one hundred thousand, one to one million, etc., which means that one gramme of the antitoxin is capable of protecting 50,000 grammes, 100,000 grammes, or 1,000,000 grammes of guinea pig. In the early researches which Behring made, he discovered that a protective serum with which he had been experimenting was potent in doses of 1-10 c.c. against ten times the minimum fatal dose of toxin. One c.c. of this serum he described as containing one immunizing unit. This was the origin of the now familiar term which has come down to us at the present time, and

by its persistent use is the source of no little confusion. In a serum of the strength mentioned, it is very easy to determine just what an immunizing unit is; but when the serum is of such strength that instead of 1-10 c.c. protecting the guinea pig against ten times the minimum fatal dose,  $100$ ,  $1000$ ,  $10000$  of a c.c. accomplish the same thing, it becomes exceedingly difficult to bear in mind the relation possessed between the strength of such a serum and the immunizing unit.

In our laboratory Behring's test being generally adopted, is carried out as follows: Two toxins of different known strengths, calculated upon the fatal termination of injection into about fifty guinea pigs, are employed for the test. The guinea pig is carefully weighed, and ten times the minimum fatal dose of toxin accurately calculated in proportion to the body weight. This toxin measured in a carefully graduated pipette is dropped into a small sterile porcelain crucible. To this the antitoxin is added, properly diluted, so that one c.c. is the smallest quantity representing the dose. These are mixed, then taken up in a small syringe and injected beneath the skin of the abdomen of the guinea pig. The guinea pig is weighed daily for fourteen days, and at each time of weighing the local and general conditions carefully observed. If the test be satisfactory, the guinea pigs show no signs of interference, its condition remains normal, its weight steadily increases.

The signs of failure are three: First, death. The guinea pig generally dies on the second or third day. Its death may have been preceded by no local or general disturbances, and the death may be quite unexpected. Generally, however, the death is anticipated by a diminution of the body weight, which may be as great as forty grammes by the end of the second day; more frequently by the occurrence of an extensive local infiltration or edema of the subcutaneous tissue. Secondly, the occurrence of the local edema. In many cases the infiltration is at first widespread, later becomes more circumscribed. If the animal does not die, the diseased tissue sloughs away, leaving a large ulcer, which generally cicatrizes at the end of the third week. Third, progressive diminution of the body weight, without local symptoms. It need scarcely be said that the progressive diminution of the body weight points to a profound interference of the vital processes of the animal. These cases generally terminate fatally, sometimes as late as the second and third week. At other times convalescence begins about the sixth or seventh day, and the animal recovers. Many of them are subsequently paralyzed.

If the determination of strength is an important feature, the preservation of the remedy is no less so. No one would voluntarily have injected beneath the skin a substance about whose sterility there was doubt. The antitoxins upon the market are preserved

with camphor, carbolic acid and trikresol. Serums preserved with camphor must always be regarded as uncertain. Their sterility depends upon the fact that they have been handled with sterile instruments, and placed in sterile bottles, not upon the little piece of camphor which floats upon their surface. Carbolic acid is far superior, but is more irritating, and less germicidal than the trikresol, which I prefer. Trikresol is a valuable antiseptic, and is a harmless antiseptic, and in the experience of many is unparalleled in connection with antitoxic serums. Unfortunately it throws down a copious precipitation of albumens, and the serum to which it has been added in consequence appears cloudy or flocculent. It is true the cloudiness and flocculence can be removed by filtration; but when the serum is filtered shortly after the addition of the trikresol to it, the change between the trikresol and the albumen sometimes continues after filtration, and serums which have left the laboratory brilliant and clear, become opaque and muddy.

I have never seen a serum preserved with trikresol in which bacteria could be found; and to my mind the most positive evidence that it is impossible for bacteria to grow in such serums, is that the 5-10 per cent. of trikresol used to preserve the serum with which aseptic precautions are always taken, is exactly the same as that added to our toxins, with which no precautions are taken after filtration, and yet which never spoil.

The antitoxins do not deteriorate by keeping, at least not in a year's time. Indeed, there seems to be a distinct gain in not using the remedy too fresh. Fresh serums seem to contain distinct irritant and hemolytic properties, which disappear in the course of time, so that the erythemas and uticarias so often following the introduction of the antitoxin serum beneath the skin are exceedingly rare in those serums, which, to use the manufacturer's phrase, have been allowed to "ripen."

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#### FLOOD CONDITIONS ON THE WEST BRANCH OF THE SUSQUEHANNA.

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By George D. Snyder, C. E., Assoc. M. Am. Soc. C. E.; City Engineer,  
Williamsport, Pa.

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The relative destructive power of fire and water has ever been a favorite subject for debating societies. We in this valley are of the opinion that water is the most destructive agent, and if you all had

been here two years ago to-day, we could have convinced you that our position was correct, without argument. I will endeavor in what follows to show you some of the reasons why we fear the destructive effects of water, and some of the conditions causing our floods.

The area that a stream drains is called its watershed or catchment basin. Streams are fed directly or indirectly by the rain that falls in this area. A certain proportion of the rainfall is evaporated; some is absorbed by vegetable and animal life, some sinks away in the ground, and the remainder flows directly into the streams. Most of the water that disappears in the earth takes the form of ground water. This water settles through the earth until it reaches an impervious stratum. There are streams, ponds, pools and lakes underground, just as there are on the surface. This underground water, in places, flows at quite a rapid rate, but at most places its motion is quite slow. The level of the ground water rises with the rainfall, just as the level of the surface streams do; only, as its motion is much slower and as it is not affected by evaporation and freezing, its flow is much more constant and without the sudden changes of surface streams. The level of the ground water will, during a long continued dry season, be at about the level of the water in the nearest stream, while after continued rains, it will be almost at the surface of the ground. It can thus readily be seen that the ground water acts as the great regulator of the water in our streams, as the rain water is absorbed by the soil and retained while it slowly percolates along, and then is discharged into the streams through springs.

Were it not for this ground water, our streams would, like our street gutters and storm sewers, be flowing full of water during a rain, and entirely dry shortly after the rain ceases. It will thus be seen that the absorbing power of the soil has a very great influence on the steady flow of water in streams. Rain falling on bare ground will nearly all flow away before the soil has a chance to absorb any, but a small portion of it; while on ground that is thickly covered with vegetation the rain will be retained until the soil has a chance to absorb it.

The surplus rainfall, over that which evaporates and is absorbed by the soil and vegetable life, flows directly into the streams, and when this surplus is large, it causes floods.

Floods of greater or less magnitude have occurred in this valley as far back as we have any authentic record. From a study of the flood records on the Susquehanna river, we find that in 204 years there have been twenty-nine floods of sufficient magnitude to be recorded by our local historians. This is an average of one every seven years. As to the heights these early floods reached we have

very little record; most of the earlier floods occurred on the main river below Sunbury, and to what extent they reached on the West Branch we have no record.

The following record of the relative heights of the floods at Pine Creek, Clinton county, was taken from Meginniss' Historical Journal:

1847 above 1810, 3 feet 6 inches.

1865 above 1847, 2 feet 3 inches.

1889 above 1865, 4 feet 4 inches.

1894 below 1889, 2 feet 11½ inches.

It will be seen from the preceding that the flood of 1889 was 10 feet 1 inch higher than that of 1810. Without any data as to the amount of rainfall, it is difficult to state how much of this increase in height of floods is due to changed conditions.

The fact that our last two floods have occurred in May and June, and were caused entirely by rainfall, and that our previous destructive flood—that of 1865—was in March, and was caused by melting snow and rain, has led many people to think that our typical flood was an ice freshet in the spring, and that a flood late in the spring or summer when the trees are covered with foliage was due to changed conditions. But from the flood records, it will be found that floods have not been confined to any particular season, but that they have occurred in every month in the year.

In the absence of specific records it is not unreasonable to assume that the average height of floods in the past is marked by the height of the bottom lands, being from twenty to twenty-five feet above the river. The very existence of such lands would be impossible if such floods as those of 1889 and 1894 occurred frequently. If such reasoning is correct, our floods have increased from 8 feet to 10 feet in height in the last one hundred years. We will, therefore, consider first the general conditions causing floods, and then the changed conditions that have caused this increase in height.

The conditions causing floods are many, such as the rainfall, amount of snow on the ground, length of stream, shape and size of watershed, arrangement of tributaries, character of the soil, fall of streams, slope of ground, amount of watershed covered with forest, etc.

It took from five inches to eight inches of rain to cause the flood of 1889. Experience has shown that we have little to fear from melting snow alone, but when we have this in connection with a heavy rain, it is likely to make a flood.

The Susquehanna river has the most extensive watershed on the Atlantic coast, within the limits of the United States. It has an area of 26,000 square miles, or about three-fifths the size of this State, and equal to the states of New Hampshire, Vermont and Massachusetts combined. This stream is divided into branches of almost

equal size at Northumberland; the North Branch draining an area of about 10,000 square miles, and the West Branch an area of about 7,000 square miles. To give an idea of the extent of the West Branch watershed, I have prepared the map you see before you. On this map all the county and township lines, towns, railroads, etc., usually shown on a map, have been omitted, leaving only the rivers and streams. It needs but a superficial view to see what a well-drained area this watershed is. A finger can scarcely be placed on the map without touching some stream. In area, this watershed almost equals the state of New Jersey. It is about one-sixth the size of Pennsylvania, and it is greater than the states of Delaware and Connecticut combined. The tributaries of the West Branch vary in size from a small rivulet to large creeks that could rightly be termed rivers.

The principal tributaries are the Loyalsock, draining an area of 490 square miles; the Lycoming, draining an area of 400 square miles; Pine creek, draining an area of 1,140 square miles; Bald Eagle, draining an area of 950 square miles; and the Sinnemahoning, draining an area of 1,010 square miles.

The arrangement of these tributaries has a great effect on the height of floods. The West Branch flows from its source to Clearfield, a distance of about 46 miles, without receiving a tributary of any size. Near Clearfield, it receives the waters of Clearfield creek. It then flows for twenty-eight miles and receives the waters of the Moshannon, and eighteen miles further it is joined by the Sinnemahoning, where it drains 2,510 square miles or about thirty-six per cent. of the total watershed. Six miles further on the river is joined by Kettle creek, draining an area of 260 square miles. Between this point and Lock Haven, which is 129 miles from the river's source, Young Woman's creek and several smaller streams discharge into the river. At Lock Haven the river is joined by the waters of Bald Eagle creek, draining an area of 950 square miles. Eight miles further on the waters of Pine creek discharge from an area of 1,140 square miles. Eighteen miles from Pine creek the waters of Lycoming creek are met with, and six miles further those of Loyalsock creek. Muncy creek is met with nine miles below Loyalsock. Below Muncy creek the tributaries are small. The principal ones are White Deer Hole creek, White Deer creek and Buffalo creek, on the right side, and Chillisquaque creek on the left side.

The West Branch is 197 miles long; Lock Haven is 129 miles from the source, making sixty-five per cent. of the length of the river above that point. The drainage area above Lock Haven is 3,150 square miles, or forty-five per cent. of the whole. Between Lock Haven and Muncy, a distance of forty-two miles, five large tributaries join the river and its drainage area increases to 6,530 square miles, being about ninety-three per cent. of the whole at Muncy.

This sudden augmentation of the stream, together with the gradual slope, accounts in a great measure for the excessive flood heights on this portion of the river.

One of the largest factors influencing the flow of streams is their rate of fall. On a normal stream the rate of fall is almost nothing at its mouth, and increases to its source. The Susquehanna river departs very largely from the normal; in fact the main river reverses the above rule. For the first twenty miles from its mouth it has an average fall of between five and eight feet per mile; this rate gradually decreasing until Sunbury is reached, where the fall is 1 75-100 feet per mile. On the West Branch this rate of fall continues to decrease until a rate of 1 59-100 feet per mile is reached between Lock Haven and Williamsport. Above Lock Haven the rate of fall rapidly increases from five feet per mile to fifty feet per mile. The tributaries that enter the river between Muncy and Lock Haven also have a fall of between five feet and fifty feet per mile.

The height the river reached in the flood of 1889 at various points along the river was as follows: At Clearfield, 17 feet; at Sinemahoning, 21 feet; at Lock Haven, 28 feet; at Williamsport, 33 feet; at Muncy, 37 feet; and at Northumberland, 18 feet. It will thus be seen that the greatest range between high and low water was between Williamsport and Muncy. The reason for this does not seem strange when we consider that the river has such a flat slope and that the drainage area is doubled on this portion by the water from five large tributaries, all of which have rapid rates of fall.

Where streams have as slight a fall as one or two feet per mile, a slight increase in the rate of fall makes a great increase in the velocity, and consequently in the capacity of the stream. For instance, on the river between Williamsport and Lock Haven there is an average fall of about  $1\frac{1}{2}$  feet per mile. If this were increased to three feet per mile, it would increase the velocity from five to seven miles per hour, and the capacity about thirty-seven per cent. If the average fall between Williamsport and Lock Haven were as great as it is below Harrisburg, it would increase the capacity fifty-seven per cent. While the average velocity of the river at a flood stage between Muncy and Lock Haven is about six miles per hour, that of the river above Lock Haven and of all the tributaries that join this portion of the river is more than twice as great, that of Lycoming creek and Pine creek being about fourteen miles per hour, and of the river above Lock Haven about twelve miles per hour. The effect of this is that the water from these mountain torrents piles up in the valley faster than the river can remove it, thus causing the river to overflow.

It is estimated that about three-fourths of the rainfall in the 1889

flood flowed directly into the streams. This would make a volume of water flowing past Williamsport, of 60,000,000,000 cubic feet. Figures fail to give the mind a proper conception of a volume this large. It is only by comparison with more familiar quantities that the mind comprehends it. This 60,000,000,000 cubic feet of water would supply the city of Williamsport, at its present rate of water consumption, for 248 years. The cities of Chicago and London are the greatest consumers of water in the world, both using about the same amount; and yet the water flowing by this city in the 1889 flood would supply Chicago or London for 5½ years, and would supply the city of New York for nearly seven years. It would fill a canal similar to the one formerly passing through this city, forty feet wide and six feet deep, for a distance reach more than twice around the world. The region drained by the West Branch has been described by early settlers as practically an unbroken forest. It abounded in never-failing springs and the streams had almost a constant flow. While there were fluctuations in the height of streams, they were neither so sudden nor so great as at present. In the settlement of this country great changes have been made in the physical condition of the watershed. The first settlement were in 1755, and the development was intermittent and slow until after the Revolution, after which the good farming land was quickly taken up, settled and cleared. The tilled land, however, at the beginning of this century, hardly amounted to more than 15 or 20 per cent. of the total area of the watershed. After the desirable farming land had been settled, encroachments on the timber lands on the steep hills and mountains were slow. Some timber was cut and rafted to its destination on the river, but there was neither the demand nor the means for transportation for any large amount of lumber. Between 1830 and 1840 the Pennsylvania state canals were constructed, and some forests were cleared and the lumber shipped; but no great development of the lumber industry occurred until the construction of railroads through the valley in the fifties, when the lumber business rapidly developed enormous proportions.

The Williamsport boom records start in 1862, when the amount of timber passing through the boom was about 35,000,000 feet, board measure. This rapidly increased until 1873, when 318,000,000 feet, board measure, passed through the boom. From 1873 to the present time the cut has run from 100,000,000 to 300,000,000. The total cut from 1862 to 1896, inclusive, will aggregate 6,608,000,000. This will cut about 10,000 feet, board measure, per acre, making the area cut over equal to about 660,800 acres, or 1,032 square miles. It has been estimated that about as much again was cut in mills up the river, and did not pass through the Williamsport boom. So that in the last thirty-five years over 2,000 square miles have been



cleared for lumber alone. This is equal to thirty-five per cent. of the area above Williamsport. If to the above is added the amount cleared prior to 1862 for lumber purposes, the amount cleared for agricultural purposes, and the amount destroyed by fire, there is very little original forest left.

It is estimated that not more than twenty-five per cent. of the West Branch watershed is covered with forest at present; that about thirty per cent. is under cultivation, and the remainder, about forty-five per cent. is land that has been cut over. This last area is practically waste land, with few large trees of any kind. Most of it is too rocky and precipitous to admit of profitable cultivation of anything but timber. The condition of this land is a disgrace to this Commonwealth. In most cases it has not improved since the lumberman left it.

Few people who have not traveled through this region have any conception of the amount of waste timber that is left by the lumbermen. The ground is laterally covered with stumps, branches, shattered trunks, bark and other inflammable debris. If it were not for the forest fires, this land would in time reproduce a second crop of timber, but about the time the young saplings have rightly started, a fire occurs among this debris and kills them off. It not only kills the young trees, but it destroys the vegetable mould and moss, which are of more benefit in holding back water than the trees themselves.

The small tributaries in this watershed originally contained innumerable small natural dams or barriers to the rapid flow of water, which consisted of fallen trees, rock, masses of driftwood and debris. In using these streams for floating logs to market, these barriers have been removed, the streams have been cleared out and straightened and the banks protected with crib work. This change in the conditions has had a marked effect on our floods, as it has greatly accelerated the flow of water in these tributaries. On the other hand, in the larger streams where few natural obstacles to the flow existed, there have been numerous structures, such as dams, bridges, boom piers, etc., built in the last 100 years, which have a material effect in retarding the flow of the river.

The changes that have occurred in the conditions causing floods in this valley in the past hundred years, may be briefly summarized as follows:

1st. The area covered with forest has been reduced from practically the whole area to about 25 per cent. thereof.

2d. The flow of water in the smaller streams has been accelerated by the removal of obstructions and natural barriers.

3d. The flow of water in the larger streams has been obstructed by the construction of dams, bridges, etc.

It may be laid down as a general principle that anything that retards the flow of water in the smaller streams, and anything that would accelerate the flow of water in the larger streams, would tend to diminish the height of floods. It will be seen by the preceding that these conditions have been reversed. The snow on our bare hillsides melts faster than when they were covered with dense ever-green forests, and the rain and melted snow finds its way quicker to the streams than it did when its way was obstructed by vegetation. The small streams flow more rapidly, and the main streams flow less rapidly than they did before, and in consequence the valley is flooded, as the water cannot flow away as fast as it is received.

The above, then, is the condition of this watershed at present, and the natural query is, can anything be done by man to improve these conditions, and make floods less destructive and less frequent? Unquestionably there can. The two principle methods of flood protection are:

1st. Increasing the channel of the main stream.

2d. Restraining the waters in minor tributaries.

Increasing the channel of streams is effected by excavating material from the bed or banks, by constructing dykes along the stream or by a combination of both methods.

In order to bring the floods below the danger line the flood height should be reduced from eight to ten feet. To effect this by excavating alone would require the removal of such a large amount of material as to make the cost prohibitive. To effect the protection of the valley by dykes would also be an expensive measure, although a cubic yard of material in a dyke would increase the channel ten times the amount a cubic yard of excavation would. A combination of the two methods where the material is excavated from the river bed and used to construct dykes, would also cost a large amount in proportion to the area it would benefit. It could, however, be locally applicable to the large towns in the valley, which could be well protected in this way; but it would not be feasible to treat the whole valley in this way.

What would perhaps be the best way of restraining our floods, and decreasing their injurious effects, would be by a broad treatment of the whole drainage area. The method of treatment would be:

1st. By decreasing the rate at which the rain water reaches the streams, and increasing the absorbing power of the soil by reforesting the mountain slopes.

2d. By decreasing the rate of flow of the small streams by the construction of numerous small barriers or dams.

3d. By the removal of obstructions in the lower valley and by exercising control of the size, number and location of all bridge piers, abutments, dams, etc., to be placed in the river in the future.

Improvements such as outlined above would unquestionably have a great effect on our floods. If ten per cent. of the first two days flow of a flood could be held back two days, our floods need not exceed twenty-five feet in height. Such a treatment of the watershed would not only decrease, and in time, prevent dangerous floods, but would be beneficial in other ways as well. It would provide a crop of timber for future use to replace what is now being cut off without any such provision. It will tend to make the flow of these streams more steady and uniform, thus making them more available as water powers. With the increased ease with which power can be transmitted by means of electricity, water powers are bound to be much more largely used than ever before, and anything that will tend to make the water supply more uniform will be of great benefit to the users of power in this valley.

It would take years to accomplish the changes in the conditions of the watershed I have outlined, and the full effect of many of the improvements would be slow in becoming manifest, and it would not be advisable for the large towns in the lower valley to wait for this slow improvement, as they can be locally protected at a reasonable expense.

Sunbury, on the main river, has protected itself by the construction of dykes. Corning, N. Y., on the Chemung river, a tributary of the North Branch, is about to construct local protective works. Williamsport has a system of local protection under consideration, consisting of increased capacity of cross section of river by extending bridges, by the removal of islands and other obstructions, and by the construction of dykes around the city.

This plan has been criticized by some of our citizens for the reason that as this city is built on a stratum of sand and gravel, they claim the water would percolate through and under the dyke so fast that the city would be as badly flooded as before. The principal argument in support of their claim is that water rises and falls in wells with the water in the river. While the height of the river undoubtedly has an effect on the height of water in deep wells, it can hardly rise as fast or reach the same stage as the river when it is high.

There are cases on record where the river has risen almost to the point of flowing over the surface into the cellars, and yet the cellars have remained dry. In some cases the water has been kept from flowing over the surface into the cellars by the construction of slight temporary dams around the houses, and yet the cellars have not become wet from percolation. A canal passed through this city for many years, with many cellars below its level, and these cellars remained dry. There are numerous log ponds in this city, the water level of which is from twenty to twenty-five feet above the river,

which are supplied by pumping, and the loss from percolation has not been great.

The dam across the river is built on a gravel foundation such as the dykes would be founded on, and yet the loss of water under the dam through this gravel must be small, as the water level does not fall below the crest of the dams even in the driest seasons.

There undoubtedly would be some percolation through and under the dyke, but the amount would decrease in time, as the river silt would tend to fill the interstices and stop the leaks in the dyke. This percolation would unquestionably be disposed of if the pumping capacity recommended by the expert engineers in their report for the protection of Williamsport were provided.

The experience of other countries, such as Holland, where dykes are maintained on much less stable ground than that here, and artificial drainage provided by pumping, has been that the amount of percolation has not been a serious obstacle to the work.

Means will likely be taken in the next moderate flood to ascertain from an inspection of the wells and cellars, the level of the ground water in relation to the water level in the river.

Whatever any city or town in this valley may do for its own immediate protection, it is clearly beyond the power of these municipalities, either individually or collectively, to do anything towards the general improvement of the flood conditions. The National Government has only undertaken flood protection measures where they could be carried out in conjunction with the improvement of the navigation, and as a government engineer has already reported that the river is not worthy of such improvement, we can hardly look for any help from it. It would seem, therefore, that our only recourse would be to the State Government, as this watershed is wholly within the limits of the State, and its protection and preservation are clearly within the State powers. The first step in this direction would be for the citizens of this valley to petition the Legislature for a commission to collect information and report on the injurious effects of floods, with their possible means of prevention in this and other valleys in the State, subject to overflow. The statistics and information in such report would be of great value, even if nothing else is done at this time. As the forestry problem and the sanitary condition of flooded valleys are so closely allied with this problem, it would seem advisable to have the Forestry Commission and the State Board of Health represented on such a commission.

It would also be advisable for the State to assume control of placing of bridge piers, dams and other obstructions in the running streams in this Commonwealth. As it now is, a railroad or bridge company can place their piers, abutments and embankments of approach to suit their own convenience, without regard to the damage

they may do others, and the only recourse is by process of law, after such damage has actually occurred. It would be much better if all corporations or individuals desiring to construct bridges, dams or other obstructions in or along the banks of any stream, were required to have their plans approved by some competent State official, just as the plans for such structures in the navigable waters of the United States have to be approved by the engineer officers of the War Department before work can proceed. In this way no structure would be permitted that would unduly restrict the waterway of any stream.

The Susquehanna, although the largest, is in a fair way to become the most useless stream on the eastern coast of the United States. It has less fall and discharges a greater volume of water than any river on the eastern slope, and yet it is not navigable, as the rate of fall is greater on the first sixty miles from its mouth than it is on the next one hundred and seventy miles. This feature would be of aid in developing water power, as yet very little is used.

In the days of the Indians, the Susquehanna was a mighty stream, navigable in a canoe almost to its source. In the spring, the run of shad was enormous and of great value to the Indians and early settlers. By the construction of dams for the State canals the shad were unable to ascend the river. The canals were of more commercial importance to the valley than the shad fisheries; but to-day we have not the shad and the canals are practically of no use to us. These dams should have some commercial reason for their existence or else be removed.

The Susquehanna has helped to work out its own deterioration by floating to market the timber that helped to regulate its flow. While timber should be cut when it matures, like any other crop, it is not wise to cut all the present crop without provision for a future one. Even the water of this mighty stream is becoming contaminated with the coal culm and sulphur water from the tributaries that flow through the anthracite coal regions, and it is a common sight to see men in boats dredging coal from its bed.

I have tried, in the preceding, to sketch some of the changed conditions that have caused the deterioration of this river, and if by our united efforts we can do something towards restoring this stream to its original purity and usefulness we will be performing a service that will be appreciated by future generations.

## THE OBSTRUCTIONS IN THE SUSQUEHANNA RIVER AT WILLIAMSPORT, AND THE NECESSITY FOR THEIR REMOVAL.

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By John Fulton, C. E., Engineer Member of the State Board of Health of Pennsylvania.

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The city of Williamsport is situate on the eastern flank of the Appalachian mountain, on the north side of the west branch of the Susquehanna river, 193 miles northwest of Philadelphia, and ninety-four miles north of Harrisburg.

It has altitudes of 515 to 530 feet above sea level; a large portion of the city is embraced between the contours of these levels. The low water in the river, below the pool of the dam, is 500 feet above tide; the level of the water in the pool of the dam is 510 feet above sea level. From these it will be readily understood that the flooding of the large portion of the city under the 530 feet level requires a rise of water in the river of only twenty feet.

It will readily be noted, on a topographical map of the State, that this Allegheny mountain diminishes in altitude in a northeasterly direction. The flattening movement, from an elevation of 2,300 feet at Gallitzin, Cambria county, to 1,400 feet above tide at Granville Summit, in Bradford county, has exerted a great dominating force in the formation of the large drainage area northwest of Williamsport, and in shaping the inclination of the watersheds eastward, and forcing the discharge of its waters in this direction.

This eastward drainage area, in the counties of Lycoming, Clinton, Centre, Clearfield, Cambria, Elk, Cameron, Potter and Tioga, embraces a surface of 5,800 square miles, the water from which must pass through the channel of the river at Williamsport.

It is of interest, on the other side, to consider the effect of the greater altitude of this mountain in Cambria and Somerset counties, in forming the dips of their drainage planes eastward.

The drainage area of these two counties covers 1,200 square miles; the water from this section flows through the city of Johnstown to the Ohio river. It will also be noted that the tributaries of the Conemaugh and Stony Creek rivers reach up to the crest of the Alleghany mountain, whilst the affluents of the west branch extend westward from this mountain summit fifty-four miles.

This result of the broadening of the eastern drainage planes, westward, from the crestline of the Allegheny mountain, is a direct consequence of the fact that the Allegheny mountain is a part of the Appalachian mountain range, and its eastern flank is a continuation of the Appalachian mountain range.

through northern Pennsylvania and New York State. The north branch of the Susquehanna river and its tributaries afford an example of the increasing dominance of this law northward.

The discharge of the water from this large drainage-shed, west of Williamsport, is greatly accelerated by the steep inclines of the several planes and channels of the affluents of the river.

The water in pool of dam at Williamsport is 510 feet above tide; at Lock Haven, 550 feet above, showing a rise in the river of forty feet in twenty-eight miles, an average rise of one and one-half feet nearly per mile.

From Lock Haven to Driftwood, the main river rises 266 feet in sixty miles, exhibiting an average rise of four and one-half feet per mile nearly.

The average elevation of the most distant sources of the affluents of the river in this large watershed is 1,821 feet above tide. The average fall of the main channels of these tributaries ranges from eighteen to thirty feet per mile. From these steep inclines it is evident how rapidly their waters are driven to the main channel of the river.

The moderate fall in the river from Lock Haven to Williamsport piles up the water and increases the height of floods. It is evident, also, that with the continued reduction of the forest area in this drainage district, by the lumbering industries, the rapidity of the discharge of the water will increase as the forests decrease. On the other side, the exposure of this bared surface to the heat of the sun will increase the amount of water taken up by evaporation, reducing its volume during the summer months proportionally; the removal of the forests producing these extreme conditions of great floods and extreme low water.

These conditions indicate, in an impressive manner, the urgent need of immediate action in widening the river channel, removing the obstructions and constructing the necessary protecting embankments to defend the city from the inundations consequent on the great floods, with the destruction of property and the menace to the sanitary condition of its citizens.

The past records show that this west branch of the Susquehanna river is subject to frequent great floods. From the year 1846 until 1895, seven of these have occurred, or one destructive flood every seven years.

The maximum height of water during these floods was from twenty to thirty-three feet above low water in the river. The loss of lives and property by these floods has not been accurately determined, but they must have been very large. The loss of lumber alone during the floods of 1865, 1889 and 1894, has been estimated at 290,000,000 feet, board measure.

The loss to the citizens of Williamsport by destruction of property, flooding of homes and business places, during these years, has been very large.

The flood of June, 1889, which is recorded as making the highest water at Williamsport, had a rainfall preceding it of 6.65 inches. Mr. T. T. Wierman, Jr., chief engineer of Pennsylvania canals, gives the height of this flood, above ordinary low water in the river, at the following localities:

Clearfield, .....	17
Lock Haven, .....	18
Williamsport, .....	33 1-3
Muncy Dam, .....	37
Northumberland, .....	18

The low water discharge at Williamsport has been estimated at 86,400,000 cubic feet per day. During the week of the great flood of 1889, this discharge was increased to an average of 10,300,000,000 cubic feet per day, or 120 times the volume of the low water discharge in the river.

It is evident that the chief cause of the floods at Williamsport is the discharge of water from the drainage planes, west of it, faster than the main channel of the river is capable of discharging it; hence, the first movement for protection against floods is the enlarging of the river channel and the removal of obstructions therefrom. Just how far this work may be required above and below the city front will be determined in the course of the work.

The average width of the river channel at Williamsport is 900 feet nearly, affording an area of cross-section of nearly 20,000 square feet.

It has been estimated that a clear water discharge section, embracing at least an area of 40,000 square feet, will be required in front of the city. To secure this the river channel can be widened to 1,200 feet at least, and an overflow section, between the proposed protecting embankments secured, having an average width of 1,600 feet.

The obstructions in the thirty-one and a half miles of the river at the city of Williamsport consist in the narrowing of the original channel by encroachments of the railroad and city bridges, by the dam and its boom cribs, with other minor impediments to the free discharge of the river water.

The present clear cross-section at the Philadelphia and Erie Railroad bridge is given at 35,000 square feet; 5,000 feet under the required section. The section at Market street bridge is now 35,000 square feet; 5,000 square feet under full water-way. The Maynard street bridge is 30,600 square feet in cross-section; 9,400 square feet under the required clear area of 40,000 square feet.



These three bridges constricting the river channel will require additional spans and elevating where needed to afford the standard section of 40,000 square feet. As the city bridges are under home control, there is no special impediment in securing the enlarged space.

As the Philadelphia and Erie Railroad bridge of 1889 was carried away in this great flood, and its successor nearly meeting the same fate in the flood of 1894, it is evident that self-interest, as well as that of protection to the city of Williamsport, will appeal strongly for the necessary enlargement to harmonize with the improvements contemplated by the city.

From the large lumbering interests requiring the maintenance of the dam and its boom piers above it, the only suggestion that may be submitted is, that all the piers in the pool of dam not absolutely needed, may be removed.

It is estimated that the entire removal of this dam would reduce the height of floods one to two feet at least.

The stone piers at the mouth of Lycoming creek, on the line of the abandoned canal, can be removed by permission from the proper authority.

In addition to these important improvements, it is designed to construct protecting embankments along the river, some distance inland from its banks.

These embankments are to be built mainly from the materials excavated in widening the river and in removing the sand and gravel bars in its bed.

The height of these embankments are to be carried to such elevations as to overtop the greatest floods at least five feet.

The improvements contemplated are to consist of three main sections. The main line of embankment on the city of Williamsport's side is to begin at Lycoming creek and flank the city along its south side. The second section consists in protecting Newberry on the west of Lycoming creek. The third contemplates a protecting embankment for South Williamsport.

The estimates submitted for these works, by the committee on flood protection, of whom Mr. John M. Young, is chairman, are as follows:

Embankment from Lycoming creek to Philadelphia and Erie Railroad crossing, with masonry, retaining walls, etc., etc., .....	\$302,365 00
Pumping plant, .....	14,000 00
Intercepting drain, .....	12,000 00
Intercepting drain, Grafius run, .....	132,000 00
Additional city sewers .....	50,000 00

Raising and extending Market and Maynard street bridges, removing cribs, etc., .....	75,000 00
Allowance for contingencies, .....	32,835 00

Total, .....	<u>\$618,200 00</u>
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The estimated cost of protecting Newberry and South Williamsport is as follows:

Embankment west of Lycoming creek, etc., protecting Newberry, .....	\$115,920 00
Embankment, etc., for South Williamsport, .....	33,890 00
Cost of land required for foregoing protection to city and suburbs, .....	48,000 00

Total, .....	<u>\$197,810 00</u>
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Exhibiting a grant total of, .....	<u>\$816,010 00</u>
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It will be noted that in the foregoing estimate provisions have been made for pumping the water received during the floods north of the protecting embankment into the river, as well as to dispose of the discharge from city sewers and prevent back flooding.

In considering the prices estimated for the several kinds of work embraced in these improvements, by Mr. Young and his committee, I believe they are ample to assure good substantial work throughout.

It is submitted that the cost of the enlargement of the Philadelphia and Erie and Philadelphia and Reading Railroad bridges, should be borne in large part, if not in all, by the respective companies, for the increased security afforded to these structures by the improvements.

When these defences against floods shall have been completed, they will afford protection to at least 1,865 acres of the city and suburban properties.

The financial management presents the chief difficulty; but when the great value of the results of this work is duly considered, with its bearing upon the future growth of the city, it is confidently believed that ways can be devised to meet the necessary expenditure.

In the presence of this demand on the finances of the city, it will be wise to consider the fact of the absolute necessity of these improvements.

In this consideration the mind should be relieved of entertaining any hopes of relief from catch water or other dams, to restrain the impetuous flow of water during flood periods, or from replacing the

forest area by planting trees. All these can be relegated from any plan of protection to the city.

The large drainage area west of Williamsport exhibits localities covering it in whole or greater part by the deepest rainfalls. The Pennsylvania State Weather Service maps show this in a very marked manner.

It is evident also that the high crest of the Appalachian mountain, as well as the elevated highlands bounding the head waters of the affluents of the west branch river, have dominating influence in producing these large rainfalls.

These elements plainly indicate the continuance of periodical floods with increasing force, as the remaining patches of forest disappear under the axe of the lumber manufacturers.

The inflexible conditions above noticed indicate quite conclusively the broad truth that these destructive floods will continue at intervals with unabated violence.

The present operations of the valuable lumber trade exhibit a considerable decrease in output from former years.

It must continue to decrease with the diminished area of available forests until it shall become of minor importance.

In the presence of this waning industry the growth of the city can only be maintained by installing a series of diversified manufactures. A Pennsylvania city should secure a large share of the iron and steel industries in connection with wooden auxiliaries.

But the condition of the city must be made safe from inundations, with their menace to health, so as to invite manufacturers and others to come to it and make it their permanent home.

The nervous unrest with the anxiety as to the recurrence of floods, the alarm at their approach, with the consequent destruction of property and danger of disease, cannot be estimated. It may be submitted that they are sufficient causes to seriously retard the growth of the city.

In the effort to abate these floods it may be emphatically noted, that every citizen of Williamsport and its suburbs is equally interested in this improvement. This arises from the fact that what concerns one concerns all. It is also evident that the dwellers in the dry portion of the city must participate in the general business prosperity or suffer in its depression.

The general advance in the value of property will follow the completion of the protection from floods. It will infuse confidence in the future growth of the city that no other means can produce. This confidence will invite increasing numbers to the city; enlarging its manufactures and trade by assuring safety and comfort to its residents.

In addition to all these the most important element to its perma-

nent growth will be aided in the assured sanitary condition secured by these improvements.

Hitherto with the prompt action of its citizens in cleansing after floods, and as Dr. A. Richter, the medical inspector, informs me, the further application of disinfectants, the health of the city has been fairly well protected from the diseases usually following inundations.

An enterprise for the common good that brings with it so many advantages, assuring the health and prosperity of the city of Williamsport and its environs, will surely commend itself to the whole people, and elicit their hearty co-operation in carrying out the plans for these permanent improvements so clearly and intelligently submitted by the flood protection committee, and assure its early completion.

In discussing these papers, Dr. C. W. Youngman, of Williamsport, said: "In order that the impression may not get weight which might naturally be inferred from the papers just read, I want to say that our statistics show—notwithstanding the falling off of the lumber business, which we all realize and acknowledge—that the various industries of Williamsport have very much more than kept pace with the decline. I say this to show that we are not sitting down quietly and allowing the lumber trade to go away and everything else with it, but we are diversifying our interests. We have grown in a way that surpasses almost the belief of those who have been familiar with the conditions attendant upon our recent floods. On the health question which has been referred to, I suppose we can safely say that the people who are tired of life can leave this city and go to Johnstown. We bring to the Board of Health one question which appears to me of vital importance, and really the only thing in connection with this discussion. It is a very easy thing for Mr. Fulton to say your bridges are very narrow and all you have to do is to widen them. But all know how difficult that is to do. We want to widen the river, to increase the channel, and to remove obstructions. But we must remember these are county bridges. The State has undertaken to underwrite these bridges. I quote from the law of 1895: 'Be it enacted, etc., that from and after the passage of this act, the Commonwealth of Pennsylvania shall, from time to time, rebuild all bridges maintained, owned and controlled by the several counties, and known as county bridges, which are now or may hereafter be erected over and across the navigable rivers, and such other streams as have been declared public highways by act of Assembly, which may hereafter be carried away or destroyed by flood, fire or other casualty and rebuild the same in case the same are again carried away or destroyed from like cause.' You will see how important this is from a future standpoint. There are two

questions which might arise in the consideration of these subjects. Here are conditions which we know threaten this property, that is, these abutments and piers. They are, so to speak, obstructions to the flow of this water, in such a way as to facilitate the carrying away of these bridges in days to come, or in future floods. Again, can the State Board of Health help us in this respect? Can this board go to Harrisburg and bring itself in direct contact with the statesmen with a view of obtaining special legislation on this matter? The present law will stand in the way. It is improbable that they could pass a bill which would become a substantial one and a supplement to that bill. Can the State Board invoke the police powers of the State for the purpose of bettering the sanitary conditions of a neighborhood of an area which is so situated as to carry the burdens of a very large proportion of the State? If you can, then will you indeed help us. If this cannot be done, then the only way is to amend this law."

Mr. Fulton remarked: "The business of this city has increased on the one hand with the decline of the lumber on the other. As regards the people going to Johnstown to get drowned, they only do that once in a great while, and Williamsport does it every seven years. There are two sides to this question. One is to put up your defense on your own side and tell your neighbors if they do not make some motion on the other, let the next high water carry them out. Another plan, I think, would be to take in South Williamsport and Newberry and make the greater Williamsport and bring it under municipal laws. Then you have it in your own hands. Is there any hindrance to doing so? I leave Dr. Lee to answer the question of the helpfulness of the State Board of Health."

In reply to a question by Dr. Rothrock as to the continuance of floods in Williamsport, Mr. Fulton said this might occur at any time.

Dr. Benjamin Lee: "My friend, Mr. Fulton, has referred to me as a legal authority on this question. I beg to say that I am a doctor of medicine and not a doctor of laws; and on so important a question as has been suggested by Mr. Youngman I do not feel competent, on the spur of the moment, to give a definite opinion.

"The only occasion on which the State Board of Health has endeavored to relieve the conditions resulting from floods has been that following the awful calamity at Johnstown, and the only reason why the State did so at that time was because the calamity was of so overwhelming a nature that not only the whole State of Pennsylvania, but the whole civilized world was thrilled with horror, and the State Legislature would never have refused to meet the bills which Governor Beaver, acting on the official declaration of the

State Board of Health to the effect that the public health was seriously menaced, assumed at that time.

"I do not believe that, as the law stands at present, it would be possible for the State Board of Health, acting simply through its police powers, to obtain any improvement in the conditions here existing.

"I do, however, think that the other alternative is possible: that the State Board of Health, co-operating with the committee of this city, which is taking up this question, could bring arguments to bear on the Legislature with a view to so modify this law of 1895 that it would contain provisions not only for the reconstruction of destroyed bridges, but for the modification of bridges already existing, which would render them perfectly safe.

"The State has taken an immense job on its hands, and every one of those bridges which is at present in danger of being swept away in consequence of the improper manner in which it has been constructed and the obstruction which it presents to the natural flow of the stream—every one of these bridges, I say, may at any moment become a drain on the public treasury, and it would be the part of wisdom in the State Legislature not to wait for the bridges to be destroyed, but to improve their construction in such a way as to remove the danger of their destruction. I do believe the State Board of Health can assist the city of Williamsport in this matter in that way, but in the exercise of its police power I do not think it can.

"The State Board of Health has obtained a concession from the Legislature to this extent: It has induced that body to establish an emergency fund of \$50,000 on which the State Board can call in cases of great public emergency, such as may arise from terrible epidemics or from floods; but you can readily see that this amount would be but a drop in the bucket as compared with that needed for the improvements of the west branch of the Susquehanna. The State Board of Health cannot use this fund except on permission of the board consisting of the Governor, the Auditor General and State Treasurer, and this permission is granted very grudgingly. We have been permitted, in case of insanitary conditions resulting from floods, to obtain very small appropriations from the commission, for the purpose of providing disinfectants, and in the case of the last flood we rendered aid of an essential character to a number of flooded towns.

"I desire to say, to the credit of Williamsport, and of your health officer, that when, after having received application from a number of cities for aid in this matter, I telegraphed to Dr. Richter to know whether it was desired that the State Board of Health should offer relief here, he replied, 'Williamsport can take care of herself.'"

## RELATIONS OF FORESTS TO PUBLIC HEALTH AND PROSPERITY.

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The Annual Address before the State Board of Health for the Year 1896, by Prof. J. T. Rothrock, M. D., State Forestry Commissioner of Pennsylvania.

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A new race of men on a new continent is like a new race of plants on a new field. It must first secure its own perpetuity, then drop into harmonious relations with its surroundings. This is the apparent truth. The real truth, however, is that it best secures perpetuity by harmony with natural laws and conditions.

We considerably now tender our sympathy to those who come of short-lived stock. They are not responsible for ancestral limitation, or for legislative inertia. But those who follow us will not be so kindly dealt with in memory if (barring accident) their lives fall much below the three score and ten limit. Our children will consider them as culpable, as sinners against some natural law, as those who failed to grasp the protection afforded by the science and the legal enactments of the twentieth century, into the vortex of whose grasp we are drifting.

All this is inevitable. Because Heaven's first law is not order, but something better—evolution—which secures order with progress. Order alone might obliterate aspiration. Evolution compels it. When that pathetic appeal was placed in the Episcopal service for those in the perils of maternity, one sufferer in fifty-three perished. But the natural process of ushering in a new life, thanks to anesthetics and aseptic treatment, has become almost as painless as it is safe. Men have passed from national slavery to national freedom, and the individual hardly recognizes the presence of law save by the blessings which it brings.

I write thus hopefully because all the travail of the earlier days would be lost if we fail to utilize the new powers of the Lord with which science is just giving us a speaking acquaintance. The deficiencies of life, the healing of the nations, the postponement of senility, are all in the womb of the future and approaching birth. This comes because evolution is the first law of nature. When Mr. Carlyle wrote that England was an island with 40,000,000 inhabitants, principally fools, he simply proved that he was a bad generalizer from well established data. England's culture, power, and

bank account, could not have been built up by a people who were principally fools. Whatever the English may be, we must acknowledge a near kinship, and this points the remark that the second sober thought of the American people, as a people, is almost as infallible as revelation. We have seen this in more than one national crisis.

Now these are my reasons for seeing so much light ahead. It is true we have been most prodigal in waste of our national resources. We have forgotten that in taking wealth from the State, which lives forever, and putting it into our pockets, we have often debased it into a product of temporary utility. That it will soon be as valueless to us when we are taken from it, as it should be if it were taken from us. All our little life as a nation has savored of prodigality; but we will become wiser. The prodigal will return to the fold of the family—the Commonwealth—and the father will receive him.

We will have wise laws and righteously execute them. We will have clean politics, filter plants, pure water supplies, and reservoirs which will hold water. Just take hope. Remember that as individuals not one of us is keeping up with the world. In some one direction, probably in many, every one of us becomes more of a back number every day that we live. Let health boards, advocates of good roads, forestry reformers, and friends of social purity, work on in hope and trust. The great eternal sun is just beyond the clouds and will soon break through. In fact it has been there all the time, but we have failed to recognize it. Now I take it that we are to have a cure from some of the evils under which our nation languishes and which cause many an anxious thought for the future. The present is a good place to think over one problem. Let us start it with a question. I ask it as a question. I have an opinion. I am not sure that it is right. This is the question: Would Williamsport have been built just here, on the flats, or nearer the hills, if floods had been as high and as frequent in earlier years as they seem to have been in later ones? Or rather, let us go further back still, and ask whether or not floods are more or less frequent than formerly. The city engineer will answer that authoritatively, I have no doubt. Whatever his answer may be, this city is safe. It has become like Holland, too populous, too wealthy, too enterprising, too important to be blotted out or to have its growth retarded. Prosperity it will have, if we must look over the surrounding dykes to see it.

But, nevertheless, here is a fact: if the water passes out of the country in a freshet, it is quite clear that it cannot remain in the country to nourish the springs and the streams. I have been at considerable pains to reach a safe conclusion. Let me here say that there is a delusion in figures because we have not accurately observed long enough to draw safe conclusions from them on the



water flow. On the other hand, I have a large faith in the man who has been driving logs all his life. If he tells me, and most of them do, that streams which were once navigable and adapted to his purposes are so no longer, and that the period during which he could count upon enough water is greatly shortened, I must believe him. He has no motive in deceiving me, and if his judgment in this matter cannot be trusted, then where shall we turn for information? He, of all others, has had the most intimate acquaintance with this problem. It is a bit of scientific affectation to talk about cyclic changes or rain-fall tables. They are premature. Recently, in Jefferson county, a gentleman who is both honest and intelligent, called my attention to the hillside over which we were walking. "When I first knew it," he remarked, "there were several steady springs breaking out on it. It was then in timber. They have all gone within late years."

It is a matter of common observation that mills which half a century ago ran almost the year through by water power alone, can do so no more, but must call in the aid of steam. Individually, I know of quite a number of such. It is not because of greater work that they require more water, for this is not the case. There has, in many instances, been no increase of work.

These are foundation stones I desire to lay down. Pure water, and abundant water, are necessary to our modern civilized life. I desire to emphasize the statement that it must be both pure and abundant. It may be either one or the other and still fail to be what we need. In fact, it is in just this combination that our great difficulty lies. Our abundant supplies are seldom pure as they come to us, and our pure supplies are seldom abundant enough to meet the requirements of the case. Yet it may be safely said that within the limits of our Commonwealth there is neither hamlet, town or city, which could not at reasonable cost have this double want supplied. By the term reasonable, I mean at a cost which is below the real value of the water to the community. Let me put this in another way. There is no town of considerable size in which the houses should not be able to have bath tubs at a moderate cost. Yet taking the State at large, it is safe to say that there are more houses without bath tubs than there are with them. If an unclean family is healthy it is due to something else than lack of cleanliness. A clogged skin may cause disease, but it can never promote health. I remember one of the regions in Pennsylvania which but a few years ago was supposed must be forever without pure water and plenty of it. I mean that portion of Centre county in which the State College is situated. It was discovered later that a subterranean river was flowing beneath it. The discovery has revolution-

ized the prospects of the place. Then, too, in the "Barrens," back of the college—a waste of several miles wide—over which we once trod with parched throats, the steel auger has revealed a copious supply of delicious coolness and purity, where the witch hazel augur could not detect enough for a dip. So it seems to me that for the length and breadth of this Commonwealth the water problem is one which can be solved, provided we observe the conditions of success. What these shall be depends upon circumstances. There is, however, one broad principle which appears to apply everywhere. Water must be hoarded as the miser does his store. In the one case, this may be done by reservoirs, whether these are created by engineering skill, or by allowing the forests to entangle the rainfall first, and then conduct it to suitable depths below the surface. In the other case it may be by diminishing evaporation.

Now, as illustrating this particular phase of water saving, I will appeal to some known facts. A no less distinguished authority than Major Raymond, of the United States engineering corps, makes the general statement most positively that in forest areas about four-fifths of the water which falls is saved, whereas on cleared areas about four-fifths is lost, either by evaporation or by running off the surface of the ground into the stream channels, and thence out of the country.

(The lecturer illustrated by stereopticon pictures the stages of extreme high and low water which grew directly out of this rapid surface drainage.)

Last October, the Susquehanna, at Harrisburg, was lower than it had been in half a century; and the illustrations showed that at McCall's Ferry, lower down on the same river, the rocky foundations of the State appeared to be laid bare. There would have been low water if every acre in the Commonwealth had been timber-clad. For at that time (October) the records at Harrisburg showed that the rainfall for the season was twenty inches below the annual average. It would, however, never have reached the extreme low stage that it did, nor have caused the farmers to drive their stock miles to water in regions where there had never before, within the memory of man, been a water famine, if we had hoarded the water of the previous season in the depths of the earth. This is sober fact, not fancy. I was recently driving along the banks of the Mehoopany creek. The bridges were old, and not much above the surface of the water, as compared with some others that I knew of. Their appearance vouched for the fact that they had during a long period of years remained undisturbed by any flood. I spoke about it to one of the residents. His answer was to the point and without the aid of any suggestion from me: "No, our bridges are never swept away. The mountains back where this stream heads

are still covered with trees. The snow takes a long time to melt, and the rain is a long time in getting into the valley." Here was a whole treatise upon hydraulics condensed into a few pithy sentences.

**This would be just the place to point the remark most explicitly, that all the forestry interests of this State can be met by proper use of the steep, rocky hillsides which have been either impoverished by a shiftless system of agriculture or never were under cultivation because of their uninviting character. Forestry is a branch of agriculture, and it simply seeks to make useful land which has no other value. There is within this Commonwealth enough of such lands, if properly cared for, to maintain, for all time, the forest functions which are essential to our continued prosperity.**

There is another side still to this problem. When streams are exceedingly high, and they flow beyond their limits, they increase danger of disease, because of the undesirable drainage with which they connect themselves. It is imperative, even if indelicate, to allude to the vast number of privies which are thus brought into immediate contact with our water supply. On the other hand, it has long been observed that a freshet following a period of prolonged drought has, under certain conditions at least, been followed by a period of unusual prevalence of malarial diseases in the valleys of the swollen streams. Hence, then, it would appear that the presence of large bodies of forest land on the head waters of our streams is a most important element in determining the abundant and steady flow of our water supply, and that, other things being equal, that source of water supply is most desirable which is most free from extreme high or low stages.

Besides the natural storage of water in the depths of the earth which our forests effect, there is to be considered their secondary or indirect storage. Take a basket of leaves in autumn and weight it. Allow it to remain out over winter, exposed to the rain and snow; then weigh it when spring comes. You will be surprised to note that it has more than doubled in weight and that this increase is due to the water which the leaves hold. Now suppose that instead of your small basket, you have a vast forest floor covered with leaves, every foot of which is absorbing and retaining moisture. Change the scene for a moment and go to the regions of California and Arizona, which are parched during the summer months. You will be surprised to learn that the majority of the streams grow smaller instead of larger after they leave their mountain cradles. Evaporation by the superheated air which crossed the surface of a **dry country has absolutely obliterated them, and it is only after periods of sudden or unusual rainfall that the stream beds carry any water. An extreme system of irrigation often cures this; but**

one of the most serious drains upon the water used for this purpose is evaporation. Indeed, it is the custom to plant lines of trees along the larger "acequias," or irrigation ditches, simply to guard against this excessive loss of water by evaporation.

With these facts in mind we may well return now to our own hillsides and admit that every damp forest flow is a safeguard over our flowing streams. The moisture which the leafy forest bed slowly gives off to the air during the season, protects and maintains in flowing condition many a small, but important stream, when it is most needed, and it does so because it diminishes the drain which evaporation would have made upon them.

In this statement I have made no allusion to the water which the living leaves on the trees are giving off by transpiration during the growing season. Transpiration differs from evaporation in this that the latter is wholly checked when the air is saturated with moisture, whereas the former is only partly checked. Transpiration is a vital process; evaporation a merely physical one. Evaporation may go on from the surface of a dead leaf, but transpiration must be conducted by a living one.

Now, the forests are incidentally associated in another way with water storage; and always should be. Our mountain ravines afford points where, at relatively small expense, vast storage basins can be maintained. The water supply of Scranton may be said to partly illustrate this condition of affairs. Such regions are usually unfit for remunerative agriculture, and should be maintained in forest condition.

All this leads up to another point. I mean the forests as compared with the fields, as gathering basins or sheds for our water supply. I recently passed along the valley of the Aughwick creek, in Huntingdon county. There had been a rain but a short time before, and the stream was turbid with the accumulated mud it held suspended. This mud came from the steep, cleared hills. It was liquid fertility, the best part of the farm. Its proper function was to produce the cereals we use as food. Its real function was to add flavor and filth to the water we drink at Harrisburg. Near by was a mountain stream. It drained a valley in which the slopes were quite as steep as those of Aughwick; but its water was pure and transparent, because it came from the woods, where the wash and consequent mud were infinitely less. The water made you thirsty to look at it.

Who will care to drink water from a mud-laden river, which is too turbid to cast a reflection, when he might have a source of supply like Ganoga or like Eaglesmere, where the shadow in the water seems as real as the solid tree itself on shore?

This, of course, calls up the question of filter plants. Their value

is unquestioned, and probably unquestionable. They come as a saving clause in the life contract which the city dweller makes with his surroundings. They are frequently the very best thing that we can have. Even if they show by infallible statistics that they reduce the death rate to an inconsiderable figure, my contention is that the coming man, and especially the coming woman, who is about here—God bless her—will never be content with anything but water from a pure source, if it can be had. Then they will filter that. There is no telling what flaws the science of the future will find in your filter. It may come, under light of the unknown rays which await our discovery, to leak germs like a sieve. The sense of purity in the next generation will make it worth while for a hotel proprietor to post up conspicuously. "We filter pure water." A distinguished engineer in Philadelphia, whose name is honored wherever he is known, recently calculated how long the procession of carts would be which hauled away the day's gathering of mud from the Philadelphia water supply, and then capped the climax of his argument by asking one to imagine that mud being hauled to the reservoirs to be dumped in, instead of being hauled away. Strain it as you will, impure water offends a sense of purity, and it is in the interest of good citizenship that this sense be encouraged rather than suppressed.

"You may break, you may ruin the vase if you will,  
But the scent of the roses will hang round it still."

Bill Nye once remarked that he thought almost anybody could stop chewing tobacco if he saw them prepare it. I have reached the conclusion that I can stop drinking almost any water which I see requires to be filtered.

Now, the practical side of all this is as applied to city life, that it does not require a very large area to collect sufficient water for our largest cities. One hundred square miles, that is ten miles square, Engineer Birkinbine asserts would suffice to supply the city of Philadelphia. It need not be very remote from the city. But it must possess, instead of the lawn and farm-like appearance, over which waving crops mature, and on which tons of barn yard product are hauled annually to produce fertility, the appearance of a forest, where living leaves on the trees and matted leaves on the ground will break the force of and entangle the water, until its slow flow into the receiving basin will carry with it no sediment. It must be guarded from contamination by factories, slaughter houses and privies. In a word, it must be a forest—pure, sacred to the Goddess of Health, and free from touch of any unclean thing.

We are slowly reaching up to the measure of possibilities, too slowly, indeed, when we remember that by delay we may destroy the chances upon which success depends. There is no human being who

does not at some time feel a desire to go to the woods. It may be with the defined object of seeking restoration to health. It may be for sport. It may be simply to rest. So universal a longing has in it something almost akin to sacredness. It must represent some want whose gratification is essential to race progress and individual success. To a certain extent its importance is well recognized by other nations. As sanitarians, however, it is our duty to consider it from quite another standpoint. We associate the woods with purer air, and with life-renewing qualities, which possibly are shared only by the open ocean. And in this connection also we may consider the isolation of the forest, where the invalid may himself have the best chance for restoration, but where at the same time his presence involves the least risk to the community. So that a double value then attaches to the presence of large bodies of original timber in any country. For thirty years men have written and found readers, have spoken and found listeners, about the Adirondacks region in our sister State of New York. The odor of the spruce bough bed, the fragrance of the balsam and birch brought hope, at least, to the sufferer from pulmonary tuberculosis, even if it did not bring health. In many instances life there in the open air actually did bring restoration. There can be no doubt about it. We will not quibble over technicalities. Patients suffering with what seemed to be the gravest pulmonary trouble, found renewal of life in the Adirondacks. It came to be the fashion. It continues such—to go to that famed region. Tourists from our own State visit it, and leave with the thrifty hotel keepers and guides thousands of dollars each season. But now let the whole truth be told. Our own State has a region sharing the peculiarities of the Adirondacks. Take a line from the eastern part of Pike county west to Tionesta, in Forest county, and it will be two hundred and fifty miles long. A large portion of this area is at least 1,600 feet above the sea. It would take in the Pocono Plateau, Bear creek, Ganoga, Laporte, Eaglesmere, and other places whose salubrious climate is well known. From a paper by Dr. Hinsdale I gather the following facts. The percentage of deaths from pulmonary tuberculosis in New York City is one out of 400. In the Adirondacks, one out of 900. In the mountain plateau of Pennsylvania it is one out of 1,330. The same balsam and birch that charm the senses in the Adirondacks are here. The same spruce towers at least as high with us. There are water falls and lakes and wild brooks in wilder glens.

It is in just some such region as this that the members of the State Board of Health were anxious to see a hospital located for cases of pulmonary tuberculosis, where the sufferer would have the largest chance of success with the least danger of communicating his malady to others. There is no doubt that a measure so full of wisdom will

sooner or later find favor with those who make our laws and disburse our revenues. It is right along the highway of progress. But it must be remembered that the climatic and other conditions which to-day constitute this an ideal region, are rapidly changing. The demand for lumber will in the near future reduce this region to a treeless area.

After this will follow the yearly riot of fire, unless wiser laws exist than now. It is fair to say that to-day the extermination of our magnificent white pine and hemlock forest is in sight. The railroad track of the lumberman ends in the heart of the woods.

There is more to be said which might have a general interest. For example, the condition of our forest streams before and after lumbering might cast some light upon the recent higher stages of water which have been a prolific cause of anxiety here. If we clean out the tributary streams to facilitate passage of logs by the removal of the thousand natural barriers which existed previously, and at the same time dam back the water in the main channels, there is no cause for wonder that a disastrous freshet often occurs before the main channels can relieve themselves of the water so suddenly thrown into them.

The thousands of miles of land within this State which have been burned over almost yearly since the time when the original forest was removed, and to this day remain unproductive, stand, when compared with other areas from which the fire has been excluded, and which are now producing a second growth of timber, as eloquent witnesses against our system of waste and neglect, which at once rob the Commonwealth of its resources and of its capacity to perpetuate its own wealth and power.

Still, I have firm faith in the future. My only anxiety grows out of the question: How long will it be before the lumberman, the sanitarian and the forester discover that their highest, most enduring interests can best be served by a policy which they should have in common? While we are reaching this conclusion, structural changes may occur over the surface of the State which will injure it, not only in fertility, but also endanger its climate.

It is a blot upon our existing laws, that while taxes are paid on timber lands, practically no protection is accorded them. This is the proper place to thank your representatives from Lycoming county in both houses of our Legislatures for the active interest they have taken in the forestry question.

### CAUSES OF INSANITY.

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By W. E. Wright, M. D., State Lunatic Hospital, Harrisburg.

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The subject which you have chosen for me is a broad one and would hence appear to be easy of treatment, but to speak specifically of the causes of insanity I know of no subject more difficult.

No other known disease claims dependence upon so many causes as insanity does. Almost every physical ailment stands out prominently for its share in its production and in many classifications of insanity you will find that the author has placed his opinion according to cause, viz.: alcoholic, syphilitic, traumatic, etc. In looking over the hospital report for the past year, I find no fewer than seventy-five causes claimed for the eight hundred cases under treatment. The same cause is often given for affections differing widely in their course and clinical history. Thus disappointed affection may be found claiming to be the cause of paresis as well as melancholia. The former terrible, organic disease, hopelessly incurable, a gradual breaking down of the great centres of mind and motion in the brain and within a few years leaves the patient helpless, bed-ridden and degenerated. While love may indirectly play a certain part in its production (as 75 per cent. of the cases give a history of syphilis) I do not believe any amount of disappointment is capable of producing the pathological conditions found in a general paresis.

The histories of insane patients are generally faulty or incomplete. It has been customary to deplore a man's condition whose destiny has been formed by his ancestors. To have insanity, imbecility or a neurosis hereditary in a family, gives rise to sensitiveness through fear of reproach, hence the family secrets are kept hidden and only revealed after persistent and direct questioning as to physical and mental health of ancestors. Thus you see the difficulties we have to contend with and as these causes are generally assigned by a friend of the patient (not a physician) who happens to fill the history blanks, you can conclude for yourselves the degree of accuracy and scientific value which the ordinary hospital tables afford in deciding the causes of mental derangement.

In fact only a week ago a patient was admitted suffering from general paresis in the second stage, whose son persisted that the disease was caused by his wife who gave him wine to drink which she had "drugged" with some inoffensive herb. Underlying this,



however, was a history of prolonged intemperance with a suspicion of syphilitic infection. Such a routine had been so regarded as a matter of fact, in the daily life and customs of the individual that his friends gave no weight to it, but were quick to seize upon the supposed conduct of his wife as the cause of his trouble.

Of the seventy-five causes previously referred to, however, it is interesting to know that heredity or intemperance, taken independently or combined, hold by far the predominating influence. The part which they bear in the relation to the cause of insanity is so great as to merit special consideration.

Heredity is given as a cause in about 25 per cent. of the admissions. This percentage is far too small, however, as has already been explained in the beginning of the paper. In many instances there may be found the double evil of intemperance and a dissipated and irregular life in a subject already predisposed to insanity.

We have to-day resident in our hospital instances of father and son, father and daughter, mother and son, mother and daughter, brothers, brother and sister. Not quite a year ago it was my unpleasant experience to admit father and son at the same time as patients in our hospital. The father in a demented state, the boy an imbecile.

Persons with bad heredity are much more liable to break down from what would be considered a trivial disturbance in the sound constitution, at the physiological epochs of life, viz.: puberty, adolescence and the climacteric. A majority of admissions occur at one or the other of these periods and could properly claim them as predisposing causes.

Doctor Clouston (Dict. Psyc. Medicine), gives the following interesting statistics in regards to the frequency of insanities of pubescence and adolescence.

"Out of the 1,706 non-congenital admissions to the Royal Edinburgh Asylum, 230 were between fourteen and twenty-five years of age. Of this 230 only two were between fourteen and sixteen; twenty-two between sixteen and eighteen. The next three years eighteen, nineteen and twenty were still low in regard to insanity production, for only forty-nine of the cases occurred at these ages.

It was the next five years, viz.: from the 20-25 year that the majority of the cases occurred, viz.: 157 of the 230 or an average of 14 per cent. each year as compared with an average of 6 per cent. for the each five years of adolescence."

In fact a comparison with the liability at other ages during the past five years of the admissions to the asylum shows that there is no period in life when uncomplicated insanity occurs more frequently than during the completion of the physiological era of adolescence (21-25 years).

As regards the two sexes it seems that adolescence does not appear to be so powerful an upsetter of mental equilibrium in women as in men. In regard to heredity and its influence in the production of insanity of adolescence, he found that a hereditary predisposition to some mental disease or to some of the neuroses was present in 45 per cent. of the whole number. He deplores the difficulty to secure family histories of insanity in most cases and suggests multiplying those you get by two if you wish any approximation to the truth. The proportion of hereditary cases in the asylum case book was only 23 per cent. as compared with 45 per cent. of the adolescents in whose cases no special effort had been taken to ascertain family history. Thus it will be seen that at the age of puberty (which may be fourteen years, and the age of adolescence (18-25 years) the brain is more sensitive and susceptible to bad influences and liable to trophic disturbances.

It is at the beginning of these epochs that the greatest care should be exercised in the training of mind and body and more especially for those who are handicapped by heredity. If these weak individuals could be given the proper mental hygiene and training, kept free from intemperance, excesses and irregular lives, their chances of mental break down and helping to fill the already horribly overcrowded hospitals, would be very much lessened. Two other great evils I would like, also, to give brief mention to. I refer to alcohol and syphilis. For the baneful effects of the former I must again refer to that distinguished member of the profession, Dr. Clouston. In his annual report for 1894 he refers to it as a "black list."

Alcoholic excess sending him eighty-three of his 176 admissions. He urges legislation for the control of habitual drunkenness which is so closely related to insanity.

Authors differ widely in their opinions of syphilis as a cause of mental disease. They all speak of syphilitic insanity as distinct from general paresis, but I believe the popular opinion to-day is that the latter disease is caused by syphilis in the enormous proportion of 75 per cent. of the cases. It has certainly been my experience to get a syphilitic history in at least 60 per cent. of the cases admitted to the institution at Harrisburg.

The majority of the subjects are men above the ordinary intelligence, who have been successful in business or otherwise, who have led active lives; lives of dissipation and debauchery, who contracted syphilis in early manhood and have indulged in sexual excesses with late hours and intemperance.

These are the factors which develop the typical general paresis and they do not require the assistance of heredity in completing their task.

I have thus briefly spoken of the three most powerful agents in

producing the down fall of humanity. What remedies can be suggested? Prophylaxis is certainly the most common sense one and the one which naturally suggests itself. The influence of heredity, to me, is sufficiently clear to call forth some legal measure which will prevent marriage of the epileptic or those who have had an attack of insanity. This does not even go far enough when you consider the number of individuals discharged or paroled from the hospitals yearly, who are already married, those who are insane yet have never been legally committed, indulging without restraint the sexual appetite and propagating a species which will either be epileptic, imbecile or a defective. Surgical measures have been recommended as a remedy for controlling the reproduction in this defective and degenerate class. While this would no doubt be a sure means, I question the practicability of castrating every man and woman who leaves a hospital cured of his or her attack of insanity.

We cannot accept so radical a law as the above suggestion and I think the majority of you will agree with me when I suggest the importance of arousing the public to appreciate these dangers and to realize the importance of providing measures, hygienic and preventive with the view of establishing a sounder mental and physical constitution. It rests, mainly, gentlemen, with the individual, and with us as his medical counsellors.

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#### SUGGESTIONS ABOUT THE SANITARY MANAGEMENT OF CONTAGIOUS DISEASES IN CHILDREN.

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By Pemberton Dudley, M. D., Member of the State Board of Health,  
Philadelphia, Penna.

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Almost everything said of the management of contagious diseases in adults, applies equally to these maladies as they affect children. But there are certain aspects of the subject in the cases of infectious diseases in children, which do not present themselves so prominently in relation to older people. These diseases taken as a class are far more likely to attack the child than the adult; consequently the sick child's associates and juvenile neighbors are in much greater peril from the contagion than the adult neighbors, and that form of juvenile association which is unavoidable in our public and private schools makes the infected child a greater menace to health and life than the infected adult is likely to be.

This paper would be open to severe criticism if it did not include the all-important injunction to have every infant successfully vaccinated before the beginning of the teething period, unless, in the opinion of the attending physician, present ill-health is such as to render the postponement of the operation advisable. No parent should pay the slightest attention to any of the so-called arguments against the necessity or the value of vaccination. They are all **sophistical, sinister, worthless.**

The best of all precautions are those which prevent us from contracting disease ourselves or from carrying it to others. A large amount of disease is caused by needless association with families in which contagious disease is present, and by attending funerals of those dead of such disease. No person, young or old, who is liable to come into contact with, or to approach, young children, should enter a house where small-pox, scarlet fever, diphtheria, measles or whooping-cough prevails, or has recently prevailed, or attend the funeral of a person who has died of one of these maladies. The only exceptions to this rule relate to those whose duties require their presence at such places; and even in the case of these persons, no **avoidable approach to young children should be tolerated subsequently, until all danger of transmitting the infection has been removed.** To the needless visitation of infected houses by parents and friends, thousands on thousands of children have owed the diseases that consigned them to early graves. Such visitation should be avoided and, in connection with diphtheria, small-pox and scarlet fever, should be prohibited.

**But when contagious disease has invaded the home: what then?** The first precaution—the very first—is to isolate the patient. It cannot be done too soon. It is usually not done soon enough. There are reasons for this unfortunate, and sometimes disastrous, delay. It is not always easy, or even possible, to diagnose a case of contagious disease in its incipency. The most skillful and experienced of our physicians meet with great difficulty, and are often unable to determine the contagious nature of a case of disease upon a first, or even a second, visit. But wherever the case exhibits suspicious characteristics, the patient should be promptly isolated; and then, the physician should not be censured, or suspected of deficient skill, in case the disease fortunately proves to be non-contagious. He should rather be warmly commended for his wise care of the interests of the family and neighbors.

**Isolation which is not perfect is not isolation.** To be perfect, it must separate the patient and nurse from all contact and approach of those who may either contract or carry the infection. The word “contact” here used is a broader term than when employed in its ordinary sense. It may be either direct or indirect. Thus “infect-

tious contact" may be had not only through the person of the patient, but through anything that has been in contact with him—the clothing, bedding, culinary utensils, excretions, secretions, air of the room, and even the walls, floor, ceiling and furniture of the apartment; and last, but by no means least, the persons and clothing of those who, in the way of duty or otherwise, have entered the room, or breathed the atmosphere of the disease.

One serious mistake often made by parents is based on the erroneous idea that persons living in the house, but avoiding the sick chamber, are not likely to carry the disease on their persons or in their clothing, and may, therefore, continue to mingle with the outside world, transact business, attend school, etc., without imperilling their neighbors. This error, especially as it relates to diphtheria and scarlet fever, has cost many precious lives and shrouded many homes in sorrow and gloom.

What was said in this paper about the perfection of isolation, might be repeated about disinfection. Partial disinfection is continued infection. The "germs" that possess the power to propagate infectious disease may be found in the discharges, the clothing and bedding, the atmosphere of the room, as well as on the person of the sufferer. The proper time and place to kill them is while we have them in our custody, and on the spot. To throw the discharges of a case of contagious disease into the cess-pool or sewer and then apply our disinfectants to them, is like turning a mad dog into the street and then searching for a policeman to shoot him. All infected substances should if possible, be disinfected before removal. I have usually recommended to my patients, the lime chloride, in preference to the mercuric chloride or the carbolic acid, not because it possesses any superior disinfecting virtue, but because accidental poisonings are less liable to occur from its presence in the house than from the others. Four ounces of the fresh chloride of lime (or six ounces if it be not perfectly fresh and strong) is dissolved in a gallon of water for the disinfection of the discharges, and a mixture of one gallon of this solution with nine gallons of water can be recommended for soaking, for one hour, the infected clothing or for washing the person of the patient or nurse.

I want to say just a word about "Isolation Hospitals" and their management. We physicians know how difficult it is to induce a mother to send her child, sick with scarlet fever or diphtheria, to a hospital for treatment. Most mothers cannot be induced to consider the question, much less to consent to such a proposal. And what wonder? God hath joined together the mother and her child, and no man can put them asunder, least of all when, amid the perils of a dreadful disease, the tie grows tenfold stronger. These hospitals will never reach their highest usefulness so long as their manage-

ment requires the child to be separated from its mother. But let these institutions be so constructed and arranged as to care for both, and permit the mother to relieve and assist the hospital nurse in certain of her duties, and mothers will soon be found welcoming the **shelter and care and safety of the hospital**, and then we shall have reached that efficiency of isolation and of general sanitation of our contagious maladies which will enable us to crush out these epidemics promptly, even in our large cities.

We physicians—and we patients—ought to be very scrupulous and very intelligently careful about the way in which we receive and encourage and co-operate with our local health inspectors. They come to us when our homes are invaded by pestilential disease, just as much in the garb and character of a true friendship, as do our physicians and nurses. They ought to be welcomed as such and their efforts furthered to the extent of our ability. There is, in the minds of some persons, a disposition to attach to the health officer and his inspectors, the responsibility for all the inconvenience and annoyance incident to the sanitation of contagious diseases; just as there are people who censure the weather bureau for all the cyclones.

An intelligent patient of mine, into whose house scarlet fever had entered, determined that not a suggestion or direction of the inspector should fail of her cordial and energetic support and execution. Promptness, energy and persistence characterized every effort she made to prevent the disease from reaching other people. As a consequence, her three other children escaped the infection, and, after a period of maternal anxiety such as none but the maternal heart can know, her sick one recovered. Subsequently the inspector said to her something like this: "Madam, your child caught the disease through somebody's mismanagement; but no other mother's child caught it through yours. So far as you had to do with the progress of this epidemic, it never got past your house; and if everybody would do as you have done, the disease would be quickly stamped out. No failure on your part has filled any other woman's home with mourning." "Well," said the relieved mother, "what a comfort it is to know that."

I have thus presented a few suggestions relating to the sanitary management of infectious diseases in children. In a brief paper like this, a formal exposition of the subject is, of course, out of the question. But in the circulars issued by the State Board of Health, very explicit directions may be obtained, which, if followed with reasonable diligence, will go far to prevent the spread of these diseases among our infantile population.

## SANITARY PROBLEMS IN FLOODED VALLEYS.

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By F. P. Ball, M. D., Lock Haven.

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I have been very graciously asked by the chairman of the committee of arrangements to read a paper of limited length upon the subject of "Sanitary Problems in Flooded Valleys," and I shall, in compliance with that request, call your attention very briefly to two problems only which presented themselves as the result of the flood of June 1, 1889.

That flood is a memorable event in the history of the West Branch Valley, not only on account of the great body of water which descended into the narrow valley, destroying life and property unsparingly, and rising out of the natural bed of the streams and overflowing the valley from mountain to mountain with many feet of water, and, all so suddenly that none had sufficient warning of its coming; but, also, on account at Lock Haven, at least, of the epidemic of fever which raged in the following autumn for months, until many hundreds of people were prostrated and many also lost their lives. This fever shall be one of the questions I shall briefly discuss to-day; but, before doing so, it may be as well to consider the first problem, namely, the causes which led up to the epidemic.

As far as my information goes, other towns along the West Branch Valley did not suffer as much, if at all, from any epidemic of disease after the flood as did Lock Haven; and one reason for that may be found in the fact that no other town received such an immense deposit of dirt and filth of all kinds, the volume of which and the offensive character of which it would be hard to describe. The town after the flood was literally filled with filth and debris of every sort; cellars were filled with a dirty water, which in a few days stunk most offensively, and after the water was pumped out, as it was in most instances, though in some it was unfortunately allowed to remain, there remained a slimy, decomposing body of mud and vegetable matter several feet deep. This deposit not only filled the cellars, but hid away in cracks and crevices, under sills and between lapboards of frame dwellings where it was next to impossible to remove it, and consequently most houses smelt of the flood, as it was commonly said, for many months afterward; that is, many houses had a musty, dirty smell for a long time after the flood, and in many instances, in

spite of every effort at cleanliness and good ventilation, though I am bound to say that in many other instances it may not have been in spite of cleanliness, but for want of it.

The streets and alleys were also filled to a depth at some places of three feet, with this same filthy, decomposing matter, as were also the lawns and gardens, so that as a whole the usually comparatively clean town was about as dirty, stinking and offensive a place as could well be found. Fortunate were they who could and did (and there were a good many such) leave the town until better sanitary arrangements were provided.

The question quite naturally arises: Why was Lock Haven subjected to this deposit to a greater extent than other towns of the valley? A reason may probably be found in the geographical location of the town. It is situated between the West Branch of the Susquehanna on one side and the bald Eagle creek, a stream nearly as large and at the time of the flood quite as large as the river on the other side. The lowlands below the town, near the confluence of the creek and river, gradually recede into the highlands back of the town. In an overflow such as we are now contemplating, the confluence of the creek and river would be at almost a right angle, and their swiftly-running currents would meet close to the base of the highlands, and the result would be a swirl or eddy right over the site of the town, which would be amply sufficient to produce the deposit just spoken of. The deposit not only filled cellars and covered lawns and gardens, but found its way into sewers, and filled gutters and natural surface drains, so that drainage through surface drains and the limited system of sewerage in use at that time was closed up by it.

As soon as possible after the flood the local board of health, of which I was at that time a member, proceeded with an adequate number of employes to take the necessary means for thoroughly cleaning the streets, alleys, gutters and sewers of the city, and to adopt measures to compel every property holder or tenant to thoroughly clean their premises, and also to use disinfectants to our, not their, satisfaction. Inspectors were appointed to visit every house, and investigate every cellar and the premises surrounding every house in the city within the flooded district; and the tales of neglected filth in which some persons usually considered respectable lived in entire satisfaction with themselves and their surroundings, was indeed a revelation. But soon there was a conflict of authority. The wise city council saw that through the liberality of the noble-hearted people of this Commonwealth there was money to spend, and they wanted to spend it, and so they took out of the hands of the board of health all contracts for cleaning and inspection; and as



there was not a man in council who knew an earthly thing about sanitation, the whole affair was imperfectly managed and unsatisfactorily done. I sincerely hope that if ever again there occurs such a flood in our valley, with the same results sanitarily, the money appropriated by the State, otherwise subscribed for sanitary purposes, may be given into the hands of the local board of health for their expenditure, feeling sure that it will be expended with more intelligence and that better results will follow. They are the proper persons to have charge of such funds; and as such boards are usually composed in part at least of men who know something about sanitation, and who are only interested for the good of the community in preventing disease, giving their time and brains for the good of others, and ordinarily without recompense, it is but natural to suppose that they would expend such money to the best advantage.

As said before, in consequence of the above facts, the streets and alleys were not properly cleaned, and I know for a fact that a number of cellars were never cleaned at all. In many instances, too, the filthy deposit was allowed to remain on lawns and gardens, where it exhaled a most unhealthy stench throughout the summer and following fall. To add to or prolong this unhealthy state of affairs, the following autumn and winter were exceptionally warm. The winter was an open one throughout; there was scarcely any frost, and no snow fell to amount to anything, or to lay upon the ground for more than a few hours—and, in fact, the little that did fall only added to the already superabundant humidity and moisture of the atmosphere. The rainfall that autumn and winter was excessive, and everything was wet, soggy and muddy. The excess of humidity, together with the warmth of the atmosphere, kept up a continual decomposition of the animal and vegetable matter deposited by the flood.

At the time of which we are now speaking the water supply of the city was derived from reservoirs in what is known as Harvey's Gap, in the Bald Eagle range of mountains. The watershed of this water supply consists of the sides of these mountains, which are quite well wooded, and the soil of which is stony and non-tillable. There are only two families living anywhere near the stream flowing into the reservoirs, one at the head of the upper reservoir, and the other one between the mountains along one of the streams, probably one mile from the basin.

At the time of the flood the precipitation of such a large quantity of water into the reservoirs was too great a strain for the dams, and they gave way, so that during the entire summer and greater part of the fall and winter the water supplied to the city was collected directly from the stream of running water by pipes extended from the water-main up into the stream. There seems to have been noth-

ing detrimental to health in the water as it was received into the main. The water itself seemed to be entirely free from any deleterious matter. There had been no sickness of any kind for many months in either of the families living near the stream.

The water-mains through the city were laid so that the termination of a main on any street was a closed extremity without a "blow-off," through which the pipes might be cleaned by allowing the water to escape through the ends. The consequence was that there was a certain amount of stagnation of water in these cul-de-sacs and a deposit of mud and vegetable matter which more or less affected the water, especially at certain portions of the mains. Since "blow-offs" have been arranged when the water is allowed to flow off through them, the quantity of this sediment is shown to be large even in the absence of specially heavy rains or other peculiar circumstances. After the flood this sediment was of course greater in amount on account of the large quantity of earth and vegetable matter washed into the mains by the heavy rains, and on account of the opportunity for its deposit by reason of the fact that for several days after the flood the water was shut off from the mains, and there was, therefore, no current through them to wash the foreign matter out.

A non-professional, but very good observer, has made the assertion to me that no cases of fever occurred in the area outside of that portion of the city supplied with water from the city water works, unless it was in persons who drank the water so supplied. At this late day I am unable to verify the statement, and am inclined to doubt it.

Having thus imperfectly reviewed the principal and appreciable causes which led to the epidemic of fever at Lock Haven in the fall and winter of 1889 and 1890, I wish to ask your attention for but a few minutes to the second problem, viz., the character of the fever, which you notice I have thus far failed to call by any specific name.

At that time physicians were not compelled to report their cases or deaths to any one, nor in fact are they now, except in contagious diseases, so that an exact statement of the number of cases is impossible, as is also the number or percentage of deaths. It may be sufficient for the purpose of this paper to say that the number of cases was so large that it kept all the physicians of the city busy from daylight to midnight to see their cases, and it was an exceptionally interesting case that received more than one visit a day. The per cent. of deaths was not large, and, indeed, considering the small amount of attention each patient received on account of their number, it has always been surprising to me that the death rate was not larger. One reason, however, for that enters into the discussion of the character of the fever which we will consider presently.


The differential diagnosis between typhoid fever from malarial disease has for many years been enveloped in considerable confusion and mystification; and it was not until Laveran, in 1880, discovered a parasite in the blood of patients suffering with malaria, that it was conclusively shown that many cases formerly designated malarial fever were in fact typhoid. Many of the so-called cases of malarial fever, continued fever, typho-malarial fever, etc., are thus shown to be typhoid fever. Thus, by a microscopic examination of the blood, much of the doubt and many of the errors in the diagnosis of these diseases may be avoided. This method of diagnosis was not adopted during the epidemic under consideration, and much diversity of opinion existed as to the exact character of the disease; some physicians claiming that it was an epidemic of remittent fever, and others it was typho-malarial, and others still that it was an epidemic of typhoid fever. Personally I have always looked upon it as a mixed epidemic, in which we undoubtedly had a large number of cases of remittent fever and an equal or larger number of typhoid fever.

This point might be illustrated by a number of cases, which, on a previous occasion and in another page I quoted at length, but which would require too much time to repeat at this meeting. It may suffice to say that at that time I saw numbers of cases which absolutely lacked almost every characteristic feature of typhoid fever, such as diarrhoea, rose-colored spots, bronchitis, tympanites, delirium, coma and stupor, etc., and presented on the contrary so many of the features of remittent fever, such as vomiting, constipation, jaundice and characteristic temperature, that in the absence of a microscopic examination of the blood and demonstration of the presence of malarial haematzoa the diagnosis seemed as clear as it could be made. All the elements necessary for the development of malarial disease, such as heat, moisture and decomposing vegetable matter, existed to a very marked degree; and I believe now, as I did then, that much of the disease which prevailed at that time might have been prevented by strict sanitary measures immediately after the flood. There is no question that there were many cases of typhoid fever, and a great many, too, that were not so diagnosed; but these cases may probably be attributed to some outside cause, such, for instance, as the milk supplied by the dairymen—though that question has never been investigated. "Filth, bad sewers or cesspools cannot in themselves cause typhoid fever, but they furnish the conditions suitable for the preservation of the bacillus and possibly for its propagation." The filthy condition of the town is not sufficient therefore to account for an epidemic of typhoid fever if considered alone. The water, which is unquestionably the most common mode of conveyance of the disease, does not seem in this in-

stance to have been contaminated with the typhoid bacillus. An examination of the water was made without discovering any such bacterium, though I am in honesty compelled to admit that the skill of the bacteriologist must be taken into consideration in these examinations. The fact that the water was filthy and offensive from the deposit of mud and vegetable matter in the water pipes does figure in the production of typhoid fever in the absence of the bacillus. There were certainly no typhoid fever cases for several years at least before this epidemic, which could contaminate the water. It seems, therefore, hardly likely, though of course it is possible, that the water was the cause of the typhoid fever which undoubtedly did exist; but it is likely that it was a factor in the production of the malarial form of the disease, which I think just as certainly did exist.

While I am not able to say exactly what per cent. of deaths there was, I am sure the mortality was very low, and I should like to claim that it was due to the skill of the physicians that it was so; but when I tell you that I visited fifty families, in which there were from one to three, or even four, sick with the fever daily for many days, your arithmetic will soon show you that I did not have much time to display great skill on any of them, and my colleagues were similarly situated. The fact of a low mortality strikes me as another proof of the malarial origin of many of the cases; and as many of them presented no head symptoms, such as delirium, stupor, etc., they were liberally dosed with quinine, which undoubtedly saved many of them from death. This assertion we do not believe could be made if all the cases were typhoid.

As I have previously said, I believe much of the sickness of the winter of 1889-90 might have been avoided by strict sanitary measures; but as typhoid fever is not caused by filth alone, it is hardly possible, and, indeed, quite likely, that we would have had an epidemic of typhoid fever that winter, regardless how clean the town might have been. But all these cases of a malarial origin, if they were of a malarial origin—and I believe they were—might have been avoided by careful attention to cleanliness. Since 1889 we have had another flood, not equaling in depth of water the flood of 1889, it is true, nor was the deposit of dirt and filth anything like as great as it was in the previous flood, but the people profiting by their previous experience, cleaned their houses, cellars and premises much more thoroughly, and we had no epidemic afterward. We probably had more sickness, it is true, than ordinarily occurs, but nothing that could be attributed to an epidemic influence. So that it seems very clear to me that much of the unhealthy condition of the people of Lock Haven, after the flood of 1889, can be attributed to the dirt



and filth deposited by the flood; and as typhoid fever is not caused by such conditions alone, many of the cases were of a malarial origin, which might have been avoided.

The large number of other cases which were undoubtedly typhoid fever would require a more searching investigation to discover their cause and avoid the disease.

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### HOW TO SECURE A PURE, HEALTHFUL MILK.

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By Augustus Richter, M. D., Health Officer of Williamsport.

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This question is certainly easier asked than answered, but as we have accepted the invitation, we have become responsible for its solution.

We might state in the onset, that the milk or dairy business is not different from any other business.

A conscientious owner of a dairy, who takes pride in his live stock—their keeping and stabling—will certainly crown his acts and business reputation with a pure, healthful milk supply, but it is the trickster in the dairy, as well as in any other business, who is always on the lookout to beat. That class of men we catch with the lactometer and cream gauge—with the frequent inspection of the dairies.

However, for a clear understanding of this important business—which rears the tender seedlings of the human family—let us assume that a young man of means has concluded to enter the dairy business and wants to know first of all from his confidential adviser where he can buy the best stock for his new enterprise, that shall be suitable for his lately-bought farm, which is a little on the leachy order.

His first thought was directed to a large dairy keeping Holstein and Friesland breeds. He was pleased with their appearance, but surprised with the condition of the stable.

These cows were large, fine, well-proportioned animals, decorated with large black and white spots, having all the characteristics of great milkers, but the great quantity of milks he tests with the lactometer and finds, to his disappointment, to be inferior in quality and will not recommend the milk to his customers. He reflects and reasons correctly, that the Holstein and Friesland stock is too large, requiring much for their own sustenance and therefore unfit for his

purposes, as the soil of his farm is light and not that of Holland or Friesland, which is extremely rich and productive, hence such large framed animals on a gravelly, leachy soil, with feeble productiveness, would only bare his hay-mow, fill the barnyard and empty his pocket. Nevertheless, the Friesland and Holstein cows are excellent representatives of the bovine family. They are the greatest milkers on record, but they also require plenty of succulent forage of highly nutritious qualities. If they have to hunt their living in the fence corners—good bye Friesian and Holstein excellency—the animals will first think of self-sustenance before filling the milk bucket.

He next considers the Alderney, Jersey and Guernsey stock. These tender strangers emigrated from English islands of the same name, near France, to America many years ago, and have ever since been ornamenting the stables of the rich, who have the means but seldom the knowledge to understand their wants.

These animals are small and light built, of a handsome fawn color. Their skin is very thin, their hair short and fine, and not sufficiently protective for the tender organs; however, their milk is excellent in quality, rich in cream but small in quantity and when the age of milk productiveness has past, the carcass and hide is of little value. They are true milkers, but no beefers.

Now, this kind of winding up does not suit our enterprising young gentleman and he further considers, that the Alderney, Guernsey and Jersey stock are not well adapted for the cold, northern winter blasts; their outer covering points to a warmer, more congenial clime, hence tubercular consumption is more prevalent among them than among the coarser, hardier breeds of our country. We have seen numbers of them in the last stage of tubercular consumption and fully recognize the danger to man in contracting this dreaded disease from their milk, especially if the udder becomes infected. Our attention has been called to witness tubercular post-mortem products larger than a fist, and when divided with the knife, cheesy or heavy masses of tubercular deposit become visible.

There is much knowledge and circumspection required to keep them healthy and in a sanitary condition. They require the best of stable attention with good blanketing during the winter months and the best of food to keep them well nourished.

With the exception of the above oversensitiveness, which an intelligent management can overcome, Alderneys, Guernseys and Jerseys are first class dairy cows.

Our young man sees that build and constitution are of first importance in the selection of dairy cows, and that he must have the proper stock, of proper age and constitution, if the milk business shall prosper.

Many of our dairy men keep cows perfectly unfit for a profitable business; such stock should pass to the abattoir and not remain in the dairy.

Our common stock is hardly fit for dairy purposes.

The best all-round animals, on light soil farms for dairying and finally for the beef market, are the hardier breeds of medium-sized cows, like the Devonshire, the Yorkshire and Suffolk polled; such breeds are good milkers and good beefers, which are the main points to observe.

"Never keep a cow in the dairy beyond the zenith of her milk productiveness."

Our sanguine young man, who intends to supply his customers with a good quality of pure, healthful milk, finds it not so easy to stock his farm with the right kind of dairy cows—still, let him not become discouraged, there are plenty of good cows to be had—only make the right selection and be industrious. But it requires work, with proper attention to cleanliness, to become a successful dairyman, otherwise, the milk will be tainted, when filth is harbored and his customers would soon not open the door, when ringing his bell.

Before parting from this interesting subject, let us recommend to our young adventurer the reading of the *American Agriculturist*, a weekly paper of great merit, where numerous descriptions of good dairy stock are given—like the Norfolk, the Ayrshire, the Durham polled, the Swiss Simmenthal, the Dexter Kerry, a hardy Irish mountain breed, the Hereford, the Norman, the Aberdeen and others. Remembering all the time that with liberal feeding the milk pail becomes the true indicator of a good cow.

Our young friend is by this time probably aware, the answer to the question, "How to secure a pure healthful milk," resolves itself in the answer of good cows, good food and perfect cleanliness, with an honest, neat dairyman for its distribution; then test milk frequently throughout the year and visit the dairies every few months and the result will be a marked improvement in the quality of the milk supply. Let us invite our friend's attention to the stable, which is, properly speaking, a garment for our domestic animals, and should not only be protective, but sanitary also. But how do we find them? The majority are deficient in light, ventilation and general cleanliness, with low ceilings, ornamented with abundant cobwebs, dust and rubbish. The whole interior dark like a dungeon. Broken windows, nailed-up ventilators, and all the pure air that possibly could enter, enters when opening the stable door. The air within such a stable is foul and stifling.

In one of these cow penitentiaries were crowded together over 30 animals, most of them full-blooded Holstein, all hanging in stocks

or in movable stanchions for month after month, without an hour's release, without a handfull of bedding, fed on decomposing glucose, refuse full of maggots. But thanks to Providence, this establishment has entered oblivion.

Every year, some of these noble creatures perished from consumption, yet the ignorance and cruelty of the proprietor made no change in the treatment of his suffering herd.

It is the ignorance of man and unsanitary keeping of the stock that brings about consumption in cows.

It is fallacious reasoning of farmers to think they can farm and run a dairy also; unless they have proper help, they certainly will fail, for no man can serve two masters at one and the same time. The modern doctor is not asked so much what will cure a disease, but what will prevent it—which is the great study of the sanitarian.

It has been demonstrated that all contagious diseases are preventable diseases and therefore chargeable with criminal offense, whether they kill the human or the bovine family.

Ask any one of the dairy men the question, "How many cubic feet of pure air are required per hour for each cow, for healthy respiration?" Can they answer the question? Certainly not. Yet a child requires 3,500 cubic feet per hour for the healthy performance of that function.

Is not the life of every air-breathing creature revolving on the invisible pivot of Oxygen?

Think and reflect, ye dairymen, what damage you inflict upon the poor animals in filth-reeking, damp, low bank barns, without a thought further than, How many cows can we place in the barn? How much milk can we strip from them?

Verily, it is a wonder that all the animals have not become tuberculous; for almost two-thirds of the year, they are forced to breathe the foul air, either in the stable or the barnyard.

When will man learn to consider life in its true light?

When will his mercy provide for every creature under his care a sanitary home?

The stable for dairy cows should be cleaned twice a day, morning and evening—unless the animals are kept under the shed—in the barnyard during the day, when the stable remains clean.

After a thorough morning cleaning of the stable, then every door should be opened, and kept so, for general floor ventilation; let the stable master apply over every wet spot in the stands and rear of them, either air-slacked lime or gypsum, to exclude the air from acting on the moist surfaces, for dryness prevents chemical action and the stable air will remain pure through one of the above applications.

The stable work being done and every stand supplied with bed-



ding, then let the curry-comb and brush be thoroughly applied to every cow, until their bodies are perfectly clean.

Cleanliness is as essential to the health of cows as it is to horses or human beings.

Having passed in rapid succession over the preliminary cares of a dairy, we might further remark that regularity in the time of milking is one of the essentials to a successful dairy business.

Any irregularity in the milking is met with loss to the owner.

Let us further consider the act of milking and handling the milk. The intelligent dairyman, unlike the sloven, enters upon his work in a clean, orderly manner. His hands are washed and with a clean apron before him, he takes two buckets, one of them with warm water to clean the udder if dirty, and two soft towels, one to wash with, while the other is for drying the udder. Thus equipped he enters upon his task, takes his clean empty bucket and milks with attention to strip every udder perfectly empty. This accomplished, he takes the milk to the strainer and thence to the cooling trough, spring-house or creamery for the expulsion of the animal heat, which, if retained in the milk, might change the caseine into "tyrotoxicon" and poison the consumers.

Every spring and fall the stable should be whitewashed, which takes down cobwebs and dust from sides, ceilings and stands and brings the stable into a sanitary condition.

Having accomplished the needed work for the sanitary comfort of the cows, let us for a moment consider their food, from whence good milk production must come.

Should you feed them turnips, onions or garlic, the milk certainly would be contaminated with that odor.

Should you feed fermented food like brewers' grain, distillery swill, glucose refuse or ensilage, another character is given to milk, unfit for the use of children, the sick and even for healthy people. Any dairy resorting to the feeding fermented food to dairy cows should at once be discarded by the public after due notice in the dairy report.

It is wheat shorts, corn and oats chopped with wheat bran added to good cut corn fodder, timothy or clover hay with clean, pure water to drink that gives the richest and best tasting milk, acceptable to any stomach, except, perhaps, the topers.

The quality of good, healthful milk plays such important part in the economy of life, that it is not only required for the rearing of the infant generation and the sustenance of the sick, but every well person should partake of it to the end of their existence. And we hope the day may not be far, when the general use of good, healthful milk will wipe out of existence every rum shop and drink-

ing hole in the land. Dens and rookeries which deprive men of reason and are a national disgrace.

And as American liberty enlightens the world, so let American temperance, industry and refinement crown her.

Discussions on the papers read were next in order.

Dr. H. H. Whitcomb: "In connection with Dr. Dudley's paper, it seems to me quite the proper thing to speak here of a recent epidemic of smallpox that has broken out at Gloucester, England, which is quite illustrative of the necessity of vaccination, and the proper reporting and attention to contagious diseases.

"It may not be known to you here that we are celebrating this year the discovery of vaccination by Jenner. Before Jenner was a resident of the city of Gloucester, where this epidemic of smallpox is raging or has been, an attempt was made by the Anti-Vaccination Society, who were residing in that place, to prevent vaccination.

"The results were such as to almost stop vaccination. Recently smallpox broke out in such violence as to almost cause a panic, stop business and close the courts, and otherwise create a great deal of loss financially to that country, as well as many deaths. The result has been that the Anti-Vaccination Society has been eradicated, and everybody is urging vaccination for the prevention of smallpox.

"It seems to me that when we have all around us the value of such a remedy for the relief of humanity, and protection from the scourge of such a disease as smallpox, it is the greatest folly for any one to bring up arguments in objection to vaccination."

Dr. Geo. G. Groff: "I was very much interested in Dr. Dale's paper. There is much that is instructive concerning the hygiene of the aged. This has been illustrated to myself recently by the deaths of a number of aged people concerning whom I either had personal knowledge or through friends who knew concerning these people. In West Chester there have been, during the present winter or spring, two deaths, the oldest 107 and the next 97. One of these persons was the mother of the treasurer of the Associated Health Authorities of Pennsylvania, Dr. Jesse C. Green, who died at the age of 97 years, and in a short sketch of her life given in the town papers, it was stated that she attended meeting this last winter, walking back and forth five or six squares. Quite a number of persons of whom I have some knowledge have died at very advanced ages, and their lives were doubtless prolonged by observance of some of the rules called attention to in Dr. Dale's paper.

"I would like to say to Williamsport that I do not know a community in Pennsylvania that has its milk so carefully guarded as is the case here. I know that it is guarded in part in other communi-

ties, but there are certain features of the way in which your milk supplied here is protected which I do not know to exist elsewhere.

"Philadelphia tries to prevent the introduction of herds affected with tuberculosis, but Williamsport sends out to the farm and lays stress not on the physical condition of the cattle alone, but also of the stable and all surroundings.

"Milk from a healthy cow can be spoiled half a dozen times before it gets to Williamsport, and I believe, after studying this question, that there is more danger outside of the cow than in the cow herself. The milk is contaminated and injury and sickness follow.

"In this city, so far as I am able to know, these matters are guarded as well as can be. I do not know of another city in which yearly you are told of the condition of the farm, the condition of the cattle, the stables, etc., and here you have 85 or 100 dairies, and make your selection of a long list of examinations of milk—it is unique and complete.

"The State Board of Health has investigated a number of epidemics of disease which have followed from the use of impure milk. One instance was about two years ago, and I think, if I remember correctly, there were 47 cases, with 7 or 9 deaths, clearly demonstrated, which might have been avoided.

"May I state to this convention that somewhere between one-half and one-third of all children born in this Commonwealth die before they attain five years of age. They die because they are not fed right. The feeding is largely in the milk supplied, and your health officer understands that.

"I congratulate you on the care that is exercised in the matter of caring for this one important matter, which is one of the most important products with which we supply our families."

Dr. Benj. Lee: "There is one point in the excellent paper of Dr. Dudley, which I would like for a moment to call attention to, and that is the value of isolation hospitals in contagious diseases. Almost all of our cities and towns of any size have some kind of a hospital, which they usually call a pest-house most unfortunately, a smallpox hospital, which can be made use of in case of epidemics of that disease. The institution, however, from its very name, is looked upon with horror by the community. People would rather die at home than go to a pest-house to be restored to health. I was greatly pleased in visiting your city hospital yesterday to find so admirable a detached hospital for the treatment of contagious diseases. I found in your hospital private wards intended for the use of persons in good circumstances—not those who desire to be treated at the expense of the community, but persons of means suffering from illness, which could be best treated at a hospital, as is the case with

the vast majority of surgical cases, so that such persons can avail themselves of the best medical skill under the best environment with the best nursing, and in every way the best opportunities for recovery.

"You have also in your isolation hospital a hospital to which any mother should not object to going with her child suffering from a contagious disease. In so doing she would accomplish a number of good results for her own family as well as for the entire community. She would avoid the risk of contagion to the other children and other members of her family, and would make it unnecessary for the house to be kept quarantined. The breadwinners of the household would thus be enabled to continue to attend to business as usual.

"There is a movement on foot at present in Philadelphia which took its origin with the women of that city, through the association known as the 'Women's Health Protective Association,' for establishing a hospital of this kind to be reserved entirely for pay patients. It is intended to establish a hospital with every comfort and every facility for the treatment of contagious diseases, and every precaution for preventing the escape of germs of these diseases outside of its walls.

"It is intended, if I understand it, that while this hospital shall be under the supervision, to a certain extent, of the board of health of the city—that is to say, its officers must conform strictly to the regulations of the board of health—yet, if the parents or relatives of the sick person so desire, such person may enjoy the attendance of the family physician. Of course, it would be necessary in this case for the physician also to be subjected to the regulations of the board of health, but the arrangements would be such that these could be complied with with very little personal inconvenience.

"I feel that this is a matter of very great importance, and one that all representatives of boards of health and of local municipalities should consider. The State Board of Health, at its meeting just held in this city has adopted a resolution recommending to the municipal authorities of every center of population of 25,000 or upward, that they should establish a separate hospital for the treatment of such affections.

"I wish that I could congratulate the whole State as Dr. Groff has congratulated you, citizens of Williamsport, that its milk supply is efficiently protected, and especially that I could thank Providence as Dr. Richter did, that the cow penitentiaries were a thing of the past. It is not so about Philadelphia; it is not so about the majority of our larger cities. These cow penitentiaries do exist, and the wretched animals which are confined there are subjected to abuse

and discomfort that no criminal is subjected to, although they have committed no crime.

"Unfortunately, throughout the State, we are far behind Williamsport in this matter.

"Dr. Richter's paper referred to the use of the lactometer, and it occurred to me that it might interest the members present to see a little instrument which has been prepared for use in families, not by boards of health, because they are usually provided with more scientific instruments. This is a cheap affair which any housekeeper can procure, and by the use of which she will be able at any time, if the slightest suspicion exists as to the quality of the milk that is being served, to test it herself. The markings are such that any one can use it."

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#### PENNSYLVANIA STATE MEDICAL SOCIETY—ACTION ON VIVISECTION.

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Whereas, Senate bill No. 1552, entitled "A bill for the further prevention of cruelty to animals in the District of Columbia," is pending in the Congress of the United States; and

Whereas, We, the Medical Society of the State of Pennsylvania, are fully convinced that this restrictive legislation, should it become a law, would seriously cripple the efforts of the earnest scientific investigators of the District of Columbia (and, indirectly, of the United States) and would retard the progress of medical science in its beneficent efforts to alleviate suffering and diminish the ravages of disease; and

Whereas, Cruelty to animals is not practiced in the District of Columbia by those scientists who unselfishly and with great personal risk strive to increase our knowledge of disease and of the methods of its prevention and cure; therefore, be it

Resolved, That the Medical Society of the State of Pennsylvania hereby urge the Pennsylvania delegation in the Congress of the United States to use all honorable means to defeat the said bill or any similar restrictive measure.

Resolved, That copies of these resolutions, attested by the secretary of the Medical Society of the State of Pennsylvania, and signed by the president, be sent to each member of the Pennsylvania delegation in Congress and to the chairman of the Committees

on the District of Columbia, of the Senate of the United States and of the House of Representatives.

WM. S. FOSTER (Pittsburg),  
President of Medical Society of Pennsylvania.

W. B. ATKINSON (Philadelphia),  
Secretary of Medical Society of Pennsylvania.

Harriaburg. Pa., May 19, 1896.

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REPORT OF DR. BENJAMIN LEE, SECRETARY, AS DELEGATE  
TO THE TENTH ANNUAL MEETING OF THE NATIONAL  
CONFERENCE OF STATE BOARDS OF HEALTH, WASHINGTON,  
D. C., DECEMBER 12 AND 13, 1894.

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In accordance with the instructions of the Board, I attended the tenth annual meeting of the National Conference of State Boards of Health, which was held at the Ebbitt House, Washington, D. C., December 12 and 13, 1894.

The conference convened at 10 a. m. of December 12, with Dr. C. A. Lindsley, president, in the chair.

The following delegates were present:

Alabama—Dr. Jerome Cochran.

California—Dr. J. R. Laine, Dr. C. A. Ruggles.

Connecticut—Prof. C. A. Lindsley, George P. Ingersoll, Esq.

Delaware—Dr. Wm. T. Skinner.

District of Columbia—Dr. W. C. Woodward.

Illinois—Dr. J. W. Scott.

Indiana—Dr. S. S. Boots, Dr. L. L. Whitesides, Dr. C. N. Metcalf,  
Dr. John N. Taylor, Dr. D. C. Ramsey.

Kentucky—Dr. George Beeler.

Louisiana—Dr. G. Farrar Patton.

Maryland—Dr. Jas. A. Steuart, Dr. John Morris.

Massachusetts—Dr. Henry P. Walcott.

Missouri—Dr. F. J. Lutz, Dr. Albert Merrell.

New Jersey—Dr. Henry Mitchell.

New York—Dr. Florence O. Donohue.

North Carolina—Dr. George Gillett Thomas, Dr. Richard H. Lewis.

Ohio—Dr. C. O. Probst.

Pennsylvania—Dr. Benjamin Lee.

Quebec—Dr. E. P. Lachapelle, Dr. J. I. DesRoches.

Rhode Island—Dr. Gardner T. Swarts.

Washington—Dr. N. Fred Essig.

Wisconsin—Dr. U. O. B. Wingate.

After introductory remarks by the president, and the reading of the minutes of the last meeting, which were approved, Mr. George P. Ingersoll, of Connecticut, opened the discussion on the following question, proposed by Connecticut: "The necessity for legislation to give the state board of health in each state power to enforce its orders and recommendations relating to public health."

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## SECOND SESSION.

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First Day, 3 o'clock P. M.

At the afternoon session of the first day Dr. Donohue, of New York, opened the discussion on the following question, proposed by Pennsylvania: "What is the best method for governmental dealing with tuberculosis in cattle?"

Dr. Lewis, of North Carolina, opened the discussion on the proposition from Kentucky: "Should medical colleges be required to devote an adequate time to instruction in hygiene, and exact of candidates for the degree of doctor of medicine an examination in this branch of medical education?"

Dr. Patton, of Louisiana, offered the following resolution, which was adopted:

Resolved, That it be expressed as the sense of this conference that medical colleges should devote adequate time to instruction in hygiene and should exact of candidates for the degree of M. D. an examination in this branch of medical education.

Be it further resolved, That state boards of medical examiners should require every applicant for license to practice medicine in their respective states to give satisfactory evidence of his (or her) acquaintance with the principles of hygiene.

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## THIRD SESSION.

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First Day, 8 o'clock P. M.

Dr. Walcott, of Massachusetts, opened the discussion on division (a), of proposition 7, submitted by the Michigan State Board of Health: "Just what national legislation is most important at this

time? Is it most important that such legislation be for the creation of a national health service which shall deal with the most important causes of sickness and of mortality in the United States, with reference to their causation, restriction and prevention?"

On motion, the matter was referred to Dr. Walcott with the request that he prepare a resolution embodying the views of the conference on this subject.

The following resolution by Dr. Lee, of Pennsylvania, was adopted:

Whereas, The conditions prevailing in the homes of the poor are such as to favor the spread of tubercular consumption; and

Whereas, All general hospitals decline to receive patients suffering from this disease, especially in its latter stages, when the danger of its communication is greatest; and

Whereas, The establishment of consumption hospitals in European countries has been followed by a reduction in the mortality from this disease in their respective communities; therefore,

Resolved, That in the opinion of this conference hospitals for the consumptive poor should be established by the authorities of all large cities, as a sanitary measure, independently of charitable motives and considerations.

Dr. Lutz, of Missouri, introduced the following resolution, which was adopted:

Whereas, The increasing pollution of bodies of water contiguous to cities and towns has become a menace to the health of communities of such gravity and extent that it is a question of national importance; therefore, be it

Resolved, That it is the sense of this conference that the whole subject of the contamination of such lakes and streams as are the sources of water supply to more than one state should be investigated by a commission, created by act of Congress and that the conclusions reached, together with suggestions for legal remedy and control, should be published from time to time for the information of interested communities.

## FIRST SESSION.

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Second Day, 10 o'clock A. M.

Dr. Walcott presented the following report:

At the meeting of the tenth Annual Conference of the State Boards of Health held in Washington on the 13th of December, 1894, it was unanimously voted: That in the opinion of this meeting it is

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essential to a proper protection of the whole people that there be established in Washington a national health authority, exclusively devoted to questions of public health; that the proposed legislation should be such as to secure for the national authority the sanitary knowledge and the hearty coöperation of existing organizations; that the body pledge itself to the support of any legislation which is adapted to the accomplishment of these results.

It was voted to adopt the report with the omission of the last clause.

Dr. Scott, of Illinois, opened the discussion on proposition 5, "Shall the state maintain supervision of the propagation of vaccine virus?" The discussion was continued by Drs. Wingate, Swarts, Cochran, Lachapelle, Lee, Ruggles, Taylor and Walcott.

Dr. Lee introduced the following resolution, which was adopted:

Resolved, That the representatives of Rhode Island and of Illinois be appointed a committee to consider the question of vaccine propagation, to report to the next conference the condition of the various propagating establishments inspected by it, and to formulate regulations for the propagation of virus, which every propagator will be expected to conform to.

On motion, Dr. Wingate, of Wisconsin, was added to the committee—Dr. Swarts being named for Rhode Island and Dr. Scott for Illinois.

Dr. Laine, of California, offered the following resolution, which was adopted:

Resolved, That states should, as far as practicable, exercise supervision of vaccine farms, and of the methods for propagating vaccine virus, and that the supply should be obtained from farms that meet the approval of local state boards of health.

The following resolution by Dr. Scott, of Illinois, was adopted:

Resolved, That the National Conference of State Boards of Health desires to place on record its sense of the important services rendered to the cause of sanitary science and sanitary organization in this country by its late lamented member, Dr. John H. Rauch, of Illinois, whose wise counsels and large experience contributed so greatly to the value of its deliberations.

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## SECOND SESSION.

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Second Day, 8 o'clock A. M.

Proposition 1, (a) "How can state boards of health best accomplish the restriction and prevention of consumption? (b) Is it

possible to have united action throughout the country on the subject?" was taken up and discussed.

Proposition 6, "What measures should be taken by the state board of health to prevent the conveyance of smallpox contagion by tramps?" was discussed.

The treasurer's report was read by the secretary.

The following officers were elected:

President—Dr. John N. Taylor, Indiana.

Vice president—Dr. C. A. Ruggles, California.

Secretary and treasurer—Dr. C. O. Probst, Ohio.

The following papers and discussions were presented in writing:

**"IS IT POSSIBLE TO HAVE UNITED ACTION THROUGHOUT THIS COUNTRY IN THE RESTRICTION AND PREVENTION OF CONSUMPTION?"**

Discussed by Dr. C. O. Probst, of Ohio, as follows:

This question may be considered from two points of view: 1st. Can state boards of health unite to prevent the introduction of consumption from one state to another? 2d. Can they unite in a general plan for the prevention of the disease within their respective states?

I see little possibility for conjoint action with respect to the first proposition. As has frequently been pointed out at our meetings, it is not possible for the various state boards of health to unite in enforcing any particular measure from the fact that only a few boards have the necessary legal authority. One of the questions to come before the conference is the necessity for legislation giving to state boards power to enforce their orders and regulations.

A further reason against carrying out the first proposition is that consumptive patients, with present public feeling, can not be restricted in their movements; and it is not possible to prevent such persons coming from Michigan to Ohio—from Maine to California.

It may be asked, Is it not possible for state boards to compel transportation companies to provide means by which the danger connected with the travel of consumptives may be avoided or lessened. The limited powers of most boards prevent this; and if this were not the case we are hardly in position to compel railroad companies to provide specially fitted cars for such travelers so long as they are unrestricted in the communities to which they go.

In considering a general plan for the prevention of consumption, to be carried out in our respective states, we must again be reminded that most of our state boards are advisory bodies. It is therefore only possible to agree upon advisory measures. Dr. Bryce will point out how state boards can best accomplish the restriction and prevention of consumption, and it only remains for the individual

boards to adopt such of these suggestions as are applicable to their respective states.

I would therefore answer this question in the negative.

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**"WHAT IS THE BEST GOVERNMENTAL DEALING WITH TUBERCULOSIS IN CATTLE?"**

Discussion opened by Dr. F. O. Donohue.

Any satisfactory solution of the very important problem of the best means of governmental dealing with tuberculosis in cattle is very desirable.

The frequency with which tuberculous cattle have been seized in market; the certainty that a much larger amount is sold, and enters into our daily food; the grave consequences which are likely to follow the drinking of uncooked milk from tuberculous cows, invest this subject with serious importance.

The conclusion was arrived at long ago, that there are very appreciable and definite dangers associated with the consumption of meat and milk derived from tuberculous cattle. Just what proportion of human tuberculosis is produced in this way will never be known; there are and always will be missing links in the chain of evidence. In the nature of things, statistical proof is the only proof that the subject admits of. Lower animals have been experimentally infected with tuberculous milk. This proof is conclusive to all minds estimating the force of the evidence, reasoning from analogy.

During the years of 1890 and 1891, the State Board of Health of New York discussed this question at length and the opinion was unanimous, that some expedient must be devised, that some check might be placed on the sale of tuberculous meat and milk. An act of the Legislature was passed, known as the "tuberculosis act," and received the approval of Governor Flower in May, 1892. The amount of money appropriated for this purpose was not commensurate with the magnitude of the work to be undertaken. It was sufficient, however, to demonstrate that tuberculosis in dairy cattle prevailed to a considerable extent.

During the eighteen months subsequent to the passage of this act 22,000 bovine animals were examined in the State, of which about 700 were proven to be tuberculous. In formulating the act, which conferred authority upon the state board of health to examine cattle for tuberculosis in any part of the state, a precedent was looked for in vain, as there was at that time no legal machinery in existence in any country which authorized the work under consideration.

The "tuberculous act" conferred full power and authority on the state board of health to use all reasonable means for ascertaining the existence and cause of tuberculosis in milch cows in any part of the state, and to cause the destruction of infected animals wherever found, and to take such measures to suppress the disease, and to prevent the same from spreading, and to give information respecting such disease to local boards of health nearest to the infected animals. It is made a misdemeanor for any person to refuse to obey the orders, rules or regulations adopted in pursuance of this act, and they are made liable to a fine of \$100.

The state board of claims was to audit all claims for compensation, which might arise under the provisions of this act.

Much adverse criticism obtained among the dairymen of the state in reference to this method of award for the slaughter of their cattle.

An act was passed at the last session of the Legislature providing an appraiser for each judicial district, appointed by the comptroller; and all cattle condemned as tuberculous shall be appraised by the appraiser in whose judicial district they are located. A stipulated amount is allowed for each animal slaughtered; not more than \$25 for a diseased unregistered animal, and not more than \$60 for a diseased registered animal. If an animal be killed, which upon autopsy is found to be non-tuberculous, the owner is entitled to receive the full appraised value, and payment is made forthwith. This method simplifies the matter, and is more equitable, and also tends to invite the coöperation of dairymen.

So important was the matter of the examination of dairy cattle for tuberculosis thought to be, that a special commission was created by statute, on the 31st day of May, 1894, to inquire further into the existence of tuberculosis in cattle, with all the powers formerly possessed by the state board of health.

This commission is composed of five members, three representing the dairy interests of the state, one representing veterinary science, and one representing the state board of health. This commission has, since its creation, been engaged in the work of examination of cattle, with a trained corps of veterinary inspectors, in different parts of the state to determine the general distribution and prevalence of the disease. It has also confined a part of its work within a given area, taking a section in the central portion of the state, in a region which was thought to be quite free from general infection from other sources. In this district 747 animals were examined, and of this number fifty were condemned and slaughtered, and autopsy held on each animal showed that they were tuberculous; showing .068 per cent. diseased; and it is believed that this is a fair average, if the state were taken as a whole. A large portion of these ani-

mals were grades, which fact controverts the opinion which obtained hitherto very generally, that grade animals were immune from tuberculosis.

Some of the objections that have been raised are the extreme difficulty in diagnosing tuberculosis during life; then, too, it is difficult to pronounce with absolute certainty whether milk from certain animals would be infective or not; but to controvert this, it may be said that it is but reasonable to insist that if an animal be suspicious it should no longer be used for supplying milk, and if diagnosis is confirmed upon autopsy, there is no question as to the undesirability of the carcass for food.

Again, as regards compensation, the loss to the individual is great, many times, in the slaughter of his cattle, and any reasonable compensation paid by the state, would in a very short time under an equitable system, be more than saved by the diminution in the number of centers of infection which might follow. The state can well afford to award reasonable compensation for the very sensible reason that tuberculous cattle are valuable to the public only when dead.

There is, too, another aspect of this matter—the danger to human life. While human life can not be measured by the money standard, the value of a cow can, and if the importance of tuberculosis in human beings could be estimated in dollars, there would be little need of further time in the process of evolution of this subject before the public would become awakened to the necessity of adopting some means of checking our annual loss from consumption from this source. It is, therefore, necessary that there should be some regular inspection of cattle in order that any affected should be eliminated from the milk supply. Every known source of infection from this scourge should be attacked as soon as discovered, and once stopped. Our energies and attention are set free to grapple with other sources that may from time to time be discovered. Such inspection and confiscation could never be detrimental to the interests of the honest dairymen; especially, if reasonable compensation were granted, under well-defined conditions.

Other countries are now engaged in this line of work. France has taken decisive action with a view of obtaining accurate knowledge of tuberculosis and affording some measure of protection. Germany has also adopted a system of systematic inspection. Great Britain appointed a royal commission to inquire into this subject, with the result of disseminating a vast deal of knowledge concerning it. Denmark is actively engaged in eliminating tuberculous cattle from the dairies, and has appropriated a large sum of money recently for this work. Switzerland and Belgium are likewise engaged in the work of extermination, by rigorous inspection.

The question is no doubt vast, yet it narrows down to one of expense. The time is now arrived that stamping out measures can be adopted, and while it will take years before the final eradication of tuberculosis can be looked forward to, yet the start must be made.

First, it is necessary to promulgate proper information among agriculturists and the people generally, a correct knowledge regarding the behavior of this disease, its mode of infection, and the fatality attending; that while under certain conditions it is hereditary, its general diffusion is due to contagion.

All the facts in the possession of the tuberculosis commission are in complete accord with the view that tuberculosis spreads with certainty among cattle, when once introduced, and especially, if they be housed in ill-ventilated, unsanitary stables; that it spreads with less activity and has only feeble contagious properties among cattle kept much of the time in the open air. This also accords with the recently demonstrated fact, that the sun's rays are inimical to the bacilli tuberculosis.

The time has now arrived, when the eradication of tuberculosis from dairy cattle can be looked confidently forward to. This can only be done by destroying the affected animals, as both their flesh and milk are unfit for food.

As a means of diagnosis, tuberculin is so accurate that a competent veterinarian can now point out any diseased animal. This agent is sensitive when tuberculous processes are present, and the reaction following its exhibition is quite certain. In Belgium I am informed that the use of tuberculin is made obligatory in the diagnosis of tuberculous cattle. I believe it is a matter which each state should undertake independently, as there is every reason to believe that the disease is not restricted to any state or country. It has been found to exist wherever inspection has been made. The relative proportion of diseased to healthy animals varies; no doubt this is in part due to the different standards of official inspection which obtains. As to how this work might be best carried out, I am of opinion that a representative commission, conformably to the genius of our government, judiciously selected and grouped should be devised, as by far the best method of creating a central authority. Rigorous inspection should then be enforced, first directed in the distributing centers and milk supplies of municipalities, and dairies supplying milk to creameries, cheese factories and condensories, after which examinations should extend to more remote districts. To carry this out successfully, it should be uniform throughout all the states, otherwise those states which are engaged in the work of eradication would be obliged to adopt a system of inspection and testing of all imported animals. Such action would be speedily fol-

lowed by complete extermination of the disease, and from a view of national economy and public health it becomes our duty, as official representatives of health departments, to press this matter.

It is admitted that this work will involve a large expenditure, but who can estimate the ultimate national gain in money and human life?

It appears to me that it is very desirable that there should be uniform action in all states, west as well as east, on this subject, and that it is very unwise for any western state to hold back in this movement, from the fact that at the present time cattle of the west are affected to a less extent than those of the east. To what extent the herds of the east are infected, we have heard from the paper just read. In Pennsylvania we have made very few experiments. They have been under the control of the State Board of Agriculture, but it does not venture to go beyond herds which are owned by institutions under the control of the state. A herd of this kind was owned by the State Lunatic Asylum at Norristown, and was examined under the supervision of the State Board of Agriculture. Forty per cent. were found to be infected by the disease. They were killed. Many of these animals were infected to a most frightful extent, and yet this asylum had been providing its inmates with milk from these infected cattle. The question of the tuberculin test, of course, comes up in this connection. The board of health of the city of Philadelphia has recently adopted a regulation that after a certain day no dairyman shall be allowed to sell milk to dealers in the city who cannot produce a certificate from a reputable veterinarian that his cattle had been tested by the tuberculin test. This is being fought by the dairymen, who claim that such a law is unconstitutional. This point is yet to be decided. The question that arises now is whether there is not danger that the tuberculin test will infect an animal with the seeds of the disease, and whether the owners ought to be compelled to subject their herds to any such risks.

Dr. Swarts: I would like to state the condition of things as they are in Rhode Island, where we have made a practical test of all conditions, acting with the law. The consideration of diseases in animals originally was placed with the state board of health. Later on, the question of tuberculosis came up and an appropriation was made and the state board of agriculture thought it was the proper duty for them to dispose of that bounty, and accordingly the subject was passed to them. The appropriations that we make annually—\$15,000—compare very favorably with those of larger states. Cattle are slaughtered in all parts of the state, there being one or more commissioners in different counties, who condemn the cattle which

are then killed, and compensation is allowed out of the sum appropriated. We have destroyed yearly large numbers of cows, and during the last year we have extended the destruction to pigs.

While we are destroying cattle in Rhode Island, a large number of them are passed over the border from Massachusetts that are found to be tuberculous, and consequently we are destroying a large number for that state.

I should like to see some united action taken, whereby the states would enter into the same consideration as that stated in the article just read.

Dr. Laine: How can we fix the value of a tuberculous animal? In both bills proposed, the maximum is put at \$70, and the minimum \$20. It does not seem to me that a tuberculous animal could have any value at all.

Dr. Metcalf: I will briefly state the condition of affairs in Indiana. We have there a state sanitary cattle commission, with an expert veterinary surgeon at the head of it. Wherever there is any tuberculosis or other disease in domestic animals discovered, the health officer immediately quarantines the cattle, and reports the case to the state veterinarian of the state sanitary cattle commission, and the cattle are appraised, slaughtered and burned. The state pays for the destruction of these cattle. I believe this to be a good law in this respect. In regard to our city boards of health, all have expert chemists who make examinations of the milk supplied. If anything is found to be wrong with it, it is condemned. Our boards of health also have authority to examine the dairies that supply milk. It is thus possible to prevent any spread of typhoid fever or other disease which might have been caused by the milk supplied. This work was formerly under the control of the state board of health, but they were glad to get rid of it.

Dr. Beeler: In my portion of the state \$25 will purchase an ordinary milch cow. We have very little tuberculosis among the cattle of Kentucky, and very seldom have this pneumonic or Texas fever. A few years ago quite a number of cattle were affected with the pneumonic trouble and other contagious diseases, and the secretary of our state board, after consulting a veterinary surgeon, decided that the cattle should be killed. The Legislature made a handsome appropriation and the owners were paid. Our representatives in the Legislature are very free in making appropriations for the payment of destroyed cattle, and they will vote for anything of that kind much more readily than for appropriations to investigate diseases among human beings. It has occurred to me in speaking about the grade of cattle affected, that in our section of the state tuberculosis is much more prevalent among Jerseys than among the common grade of cattle. Jersey cattle are generally housed in badly-



ventilated stables, and are thus open to disease, while the other cattle, being left out of doors, are not so liable to infection. As for the government taking charge of the business, I think that would be out of the question. Here the difficulty arises from one state having laws governing the subject, and the one adjoining not having any. In our section of the country we are much troubled by the bringing in of droves of cattle from Texas, and we have to watch closely for Texas fever.

Dr. Lutz: In Missouri, our Legislature readily appropriates money for the defraying of expenses of killing cattle. The only objection made to the present method of managing the destruction of animals in Missouri is that it has become a very expensive matter to the state. Tuberculosis is not a very common affliction of cattle. We are troubled mostly by cattle which have been brought into Missouri from Texas. It is found by experience that when a man has a horse sick with glanders or other contagious diseases, he gets from the state treasurer the full value of the animal—not exceeding \$65—and this draught upon the public treasury is becoming so great as to attract the attention of the governor, who contemplates recommending in his message a modification of this law. In our cities the question of tuberculosis in cattle, especially with reference to the milk supply, has been a matter of much contention. In our cities, especially St. Louis, we have a very large number of small dairies, which are run by the owners of two or three cows. Necessarily, such people must house their animals in a limited space, and it frequently happens that they are kept altogether in sheds. This, of course, results in a quality of milk that is almost unfit for consumption. But, on the other hand, the political influence which these people yield is such as always interferes very seriously with the enactment of ordinances, both for the inspection of the animals and of the milk. In St. Louis there is at present a milk inspector whose duty it is to examine the milk, but in spite of this comparatively few animals have been found diseased, killed and paid for. The question as to whether the state veterinarian should be under the control of the state board of health is, perhaps, a debatable question. We have had no experience as to whether it is best for the state board of health to have the control of the veterinarian. The question of tuberculosis in cattle is one with which we are sufficiently familiar to know that it is of great importance to have wholesome conditions surrounding the animals in order to produce wholesome milk for the consumer, but whether the best results are achieved by having the state board of health control the veterinarian, we do not know.

Dr. Walcott: I would like to enter a caveat against what might seem to be a condition of things in Massachusetts as represented by

Dr. Swarts. Massachusetts has done a great deal for the prevention of tuberculosis, and is spending a great deal of money in much the same way that Rhode Island is. With reference to the general policy of treating tuberculosis, it seems to me that it is not altogether a well-considered one. I happen to be a trustee of a large hospital—in fact, the largest in the state. We had there, under the best possible conditions, a herd of ninety-two cattle. A very expert veterinarian informed us in the summer that he thought five of them were diseased. They were immediately killed and were found to be tuberculous, but a very careful examination showed no other animals to be diseased. The injection of the tuberculin, however, has shown that ten per cent. of that herd was diseased. A slaughter of these animals distinctly showed tuberculosis, but there is no question that the animals were merchantable, and could have been sold anywhere as such. The animals were of a good breed—of the same breed that has been sold for \$200. One of the most expensive herds in Massachusetts, made up of Channel Island animals, was a short time ago found to be so diseased that the owner of it destroyed every one of them.

Now, we have undertaken in our state to wipe out tuberculosis in animals. It seems to me that it is about as absurd an undertaking as it is to talk about wiping tuberculosis out of the human race. You are going to limit it, possibly, but as for stamping it out, that will lead to financial difficulties and many other evils. I am very certain, that although we are disposed to spend money, we shall abandon the question of destroying tuberculous animals until we find some other and more practical method.

Dr. Cochran: There is one aspect of this question which has only been incidentally alluded to as yet, and that is the question as to whether tuberculosis in cows produces tuberculosis in the human race. I take it for granted that the meat of a tuberculous cow would make very good beef, provided it was properly cooked. Tuberculous milk, when not cooked, may produce tuberculosis in the human animal, but I believe the danger from that source has been very much exaggerated. I think that the existence of tuberculosis amongst cattle does not involve any very large amount of danger to the human creatures who consume the meat and the milk.

Dr. Lachapelle: This is, of course, one of the most serious questions and most difficult to solve, because the question is not a simple one, but involves many other problems. As it is now, we find out that tuberculous disease is very frequent with cattle, but we know little or nothing about the way it is propagated. We do not know whether it is by heredity or on account of the way the animals are kept and fed. I think our efforts in this matter should be especially directed to the finding out the best way to reduce the number of the

tuberculous cattle, because, as has just been stated, if we undertake to advise the government to pay all the expenses incurred in the slaughtering of animals, the amount will be so large that the government will not be willing to sustain such an expense. On the other hand, if we should ask the breeders of the animals to stand this expense they will also object. Speaking of the danger arising from the milk supply, I think that in the large cities, where the dealers are supplied from the country, the local governments should exact, in their granting of licenses to these dealers, that they should allow the stable to be inspected and their animals submitted to a test, to find out whether there is any tuberculous disease among the cattle; and if such test establishes the fact that there is such a disease, that the license should be cancelled, that is, unless they are willing to slaughter the animals. In this way, I think it would be possible to make the proprietor of the animals share in the loss of the government. In the granting of all licenses the privilege of inspection and of testing the animals should be reserved, and if an animal is found to be diseased, the proprietor should slaughter it or lose his license. Of course, I am not prepared to give a formal opinion on the matter, but just now we are not in any position to adopt a resolution in this matter advising the government, as it is a very serious matter and we are not sufficiently informed as to the best method of preventing the disease.

Dr. Essig: The question of tuberculosis will perhaps furnish us with more legislation than benefit to the people. As has before been stated, to undertake to stamp out this disease in cattle by destroying all animals demonstrated to be suffering from tuberculosis, is in my judgment, as impossible as it is to stamp out tuberculosis in the human race. Throughout the west and southwest especially there is no difficulty in getting any form of legislation which will benefit the honest, horny-handed son of toil. I think that at the present time the best thing that can be done is the inspection of our dairies, and the prohibition of furnishing milk from dairies containing cattle not healthy—prohibiting the furnishing of milk from dairies with unhealthful surrounding—prohibition of the furnishing of milk from cows unhealthfully fed. The undertaking to legislate for the destruction of all cattle demonstrated in any manner, whether by the tuberculin or other test, to be tuberculous, is going to put an indebtedness upon the various states which they will be unwilling to bear, and yet we will have tuberculosis.

Dr. Merrell: Recently, in St. Louis, a commission was appointed by the mayor for the purpose of canvassing the question of dairy regulation, with a view of preventing the sale of milk from diseased cattle. Their recommendations, which are expected to be

embodied in a bill to go before the council, were practically the same as the recommendations of the gentleman who just spoke—that is, the exacting from every person selling milk a provision that when they take out a license they bind themselves to subject their dairies to such inspection by the veterinarian of the state board of health as that body may declare necessary. The object of this regulation was to cut out of each herd any animal under suspicion of being diseased, and in order that the animal might be kept under observation until its true condition could be determined. Any suspected dairy failing to comply with these regulations shall have the sale of its milk suspended for the time being, and any one refusing to comply with these conditions shall have his license revoked. It strikes me that this is a move in the right direction, and if such regulation can be universally adopted it will come nearer to solving this question than any other method yet proposed. As stated before, we have a state veterinarian, and it has recently been proposed that the state veterinarian shall be under the control of the state board of health and subject to its orders. As yet, the exact relations of this officer to the state board of health have not been determined. The question is a very large one, involving the expenditure of large amounts of money in our state, by the payments for cattle which have been destroyed, and this amount has been so very large, that without doubt some legislation will be enacted very soon with a view to limiting such expenditure.

**Dr. Donohue:** One of the speakers has raised the question that until it can be proven that tuberculous meat and milk conveys infection to the human being we are not in a position to advocate any remedial measures. As stated in the paper recently read, statistical proof is the only proof that we have or that we will have. We are not allowed to experiment on the human animal, but by all persons who have given the matter any consideration it is admitted that a certain amount of tuberculosis is induced from tuberculous milk. Within the past two weeks one of our inspectors killed some tuberculous cattle, and the children of two of the owners were found to be suffering from tuberculosis. The fathers and mothers of the children were healthy. The city of Buffalo has enacted a municipal regulation to the effect that a dairyman supplying milk to the dealers shall furnish a certificate to the authorities stating that his cattle have been examined for tuberculosis. It does not make this mandatory on anyone, but a list is published of all those who have complied with the regulations and of those who have not; and the people are at liberty to choose between the dairymen for their milk supply.

It is admitted to be a large question, and there are a great many causes of tuberculosis of which we are yet ignorant. It seems to

me that in every state there should be a central authority to investigate certain infected centers with a view to lessening the disease in these localities. The commission now having this matter in charge in New York is carrying on the work on the same lines previously adopted by the state board of health, and it is meeting with no antagonism now. Three representatives of the dairymen were placed upon this commission and one from the agricultural board, and that there should be no reflection on the board of health, the president of that board was also placed on the commission, which is now pursuing the work outlined by the state board of health. With few exceptions, the people in New York State are in perfect harmony with the work that has thus far been done.

Dr. Morris: Is it not possible for the meat inspectors to detect disease in dead cattle or in that exposed for sale, by the use of the microscope?

Dr. Donohue: It might be possible if he were a skilled scientist, but I doubt if he could. In reference to the inspection of milk, I think it is of little use. He could determine nothing but the relative amount of water, and that would amount to little or nothing.

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**"THE NECESSITY FOR LEGISLATION TO GIVE THE STATE BOARD OF HEALTH IN EACH STATE POWER TO ENFORCE ITS ORDERS AND RECOMMENDATIONS RELATING TO PUBLIC HEALTH."**

George P. Ingersoll, the legal member of the Connecticut State Board of Health, opened the discussion as follows:

I. The question as proposed for discussion is subject to certain limitations and qualifications. It is not to be presumed that any legislation is desirable which would give a state board of health absolute power to enforce any orders or recommendations relating to the public health. That would be in effect giving the state board of health the right to legislate. That right belongs to the people, and is exercised by them through their representatives in the State Legislature. But what is intended by the subject proposed is the discussion of the advisability of, or the necessity for, legislation to give the state board of health power to enforce its own decrees within certain defined limits. In other words, that the Legislature of a state should more exactly define the duties of the state board of health, and where necessary for the preservation of the public health, give within certain well-defined limits, its orders the force of law.

2. In most states the state board of health has only advisory powers. The statutory provisions defining the powers and duties of these boards vary in the different states, but there is an apparent

uniformity in the method of their organization, and the purpose they are designed to subserve. As a rule the state boards of health are not invested with any acknowledged executive duties, this being relegated usually to local boards, and their powers and duties are chiefly inquisitorial and advisory, both in relation to the government and the local boards. A student of statutes relating to health has said in general of state boards of health and their duties: "They have cognizance of all matters touching the interests of the health and lives of the citizens of the state, and are directed to make special study of vital statistics, the causes of disease, and especially of epidemics, the sources of mortality and the effects of localities, employments and other conditions upon the public health. They are authorized and required to make investigations, and to collect and preserve such information in regard to these matters as may be useful in the discharge of their duties, and contribute to the preservation and promotion of the health of the people." I believe, in general, in having the state board of health an advisory board, but in certain directions and for certain reasons I think their power may well be extended.

It seems to me there are two reasons why the state board of health in each state should not be simply an advisory board.

First, because being the highest health authority in the state, and having no power to enforce any of its orders relating to the public health, it does not command the respect of the public at large that other heads of the state government do by reason of their having that power.

Secondly, because in matters relating to the health of inmates of public state institutions, it is only through the state board of health having powers to enforce its own orders that necessary reforms can be accomplished.

A state board of health without power in case of sudden emergency is about as effective as an engine without steam. You can ring the bell of the engine and make a great noise, shout, "Look out!" "Danger!" but you can't go ahead. An engine of this sort may cost a good deal of money, may make a good appearance, but if all its power is confined to its being used to make a noise, it will not command the right kind of public attention. In some states power is given, but no right to use it. There may be steam in the engine, but it can't go ahead without an engineer. Take, for example, a statute which gives the state board of health power to examine into nuisances or questions effecting the security of life and health in any locality, and in such case the state board of health has all necessary power to make such examinations, and the state board of health makes a report of the results of such examination, and that report

is filed with the secretary of state, if it has been approved by the governor. Then the statute goes on to state that the governor may "In relation to things found and certified by the state board of health to be nuisances, declare them to be public nuisances and order them to be changed." In such cases, when such order has been made, the statute continues, the governor may by his further order in writing require the district attorney and other officers of their county to take all necessary measures to execute and obey the order of the governor. This statute is a good example and illustration of the present status of law in some states. Here the state board of health makes an examination, finds a state of things existing which endangers the public health, and they make certain orders and recommendations as absolutely necessary to the preservation of the public health, and those orders are published or not by the governor as he sees fit. If he doesn't choose to approve of the orders, the public health must suffer. If he doesn't approve the orders, they become the orders of the governor and must be obeyed as such, and the board which found the condition to exist and pointed out the remedy loses the confidence and respect of the people, through not being entrusted with the power to enforce of itself the necessary orders and recommendations. The head of every other department of state government is invested with certain power, and that power brings respect for its authority. The state board of health, though the head of the sanitary department of the state, through simply being an advisory board, loses a large share of the public respect which is shown towards the other departments.

Now, in illustration of the second reason why it is advisable that the state board of health should have more than advisory powers in certain directions, notably in case of state public institutions, let me give an example of a case that occurred during the past year in Connecticut. The State Board of Health in Connecticut has power to examine into the sanitary condition of any public institutions upon complaint of any inmate and advise what remedies should be taken in case a bad state of sanitary affairs is found to exist. The state board of health visited a county jail; found there were in all thirty-six cells. At the time of the visit of the State Board of Health there were ninety-six prisoners. Each cell was only large enough to accommodate one prisoner. The other sixty were provided with bunks built against the outer wall in the narrow corridor. In these very cramped, close and ill-ventilated quarters nearly 100 men were huddled together night and day, a part of the time, at least, with no occupation but such as the forced and unwholesome and degrading social relations with each other may develop.

No water closet or privy of any sort existed, but the men used

their buckets as occasion required, in the open corridor, and the discharges were poured into a funnel-mouthed sink (also in the corridor) leading to a cess-pool just outside the walls of the jail.

The effluvia from these sources can readily be imagined, and though the imagination may fall short of the reality, further description is not necessary.

In this state of affairs which was a disgrace to the civilization of the nineteenth century, the State Board of Health made recommendations and even demands upon the county commissioners who were charged by law with the care and maintenance of the institutions, that an addition be placed upon the jail and that sanitary changes be made at once; but in spite of the recommendations and demands of the State Board of Health, the commissioners not choosing for their own reasons to make a change at once, and knowing that the State Board had no power to enforce its decrees, simply allowed the institution to stand in that condition. Now, while I would generally make the State Board of Health an advisory board, yet in matters relating to the health of inmates of purely state and public institutions, I think it would be advisable that in each state there should be a statute passed to the effect that, upon complaint of any inmate of any hospital, asylum or public institution, to the State Board of Health, and whenever directed by the governor, it shall be the duty of the State Board of Health to cause an investigation of the complaint, and whenever said State Board of Health, after an examination shall find any hospital, prison, asylum or other institution, to be in such sanitary condition as to endanger the health of the inmates thereof, or the quality or amount of food served therein as unfit for the inmates thereof, said State Board of Health shall submit a written report to the officers legally chargeable with the care and maintenance of said institution, said report setting forth the condition found to exist and the necessary remedy for it. It shall be the duty of the officers so legally charged with the maintenance and care of such institution to forthwith comply with the requirements of such report, and any failure so to do to be a misdemeanor and punishable as such.

In conclusion, let me say I think there is necessity for Legislature to give to the orders of the State Board of Health the force of law within certain well-defined limits, chiefly in orders relating to state institutions.

Dr. Lee: Mr. President, I have listened with deep interest to the paper of the gentleman from Connecticut as well as to the discussion which has followed. I am strongly of the opinion that a state board of health should possess executive authority and should not be a mere advisory board. This I hold to be necessary in order



to enable it to command the respect of the community, and also to impress the State Legislature with a proper sense of its importance to the well being of the state. Comparatively few legislators are men of sufficient intelligence, education and breadth of mind to be able to appreciate the importance of vital statistics, and a board whose principal duty is to collate and compile such statistics will be very apt to find itself left. The average American mind wants some practical result, and is not willing to wait long years to see the good which will result from statistical work. To my mind the single word used by the reader of the paper which conveyed the gist of the matter was the word "misdemeanor," which, in the eyes of the law, carries with it the thought of punishment by imprisonment, as well as by fine. Every ordinance of a board of health, state or local, should be able to be enforced, if necessary by imprisonment. This is the only weak point in the law creating the State Board of Health of Pennsylvania. While that board has executive powers it can enforce them only by fine, the limit of which is one hundred dollars, and the amount of which is at the discretion of the court. Probably the majority of cases in which our board is appealed to for relief are those of the pollution of streams. That pollution is caused by manufacturing corporations, often of great wealth. A fine of one hundred dollars, even if occasionally repeated, would be a trifle to them as compared with the expense to which they might be compelled to go to prevent the contaminating materials discharged from their works from entering the public stream. If, however, we could say to the gentlemen composing such corporations, "If you neglect to obey the instructions of this board, you render yourselves liable to imprisonment," that, I believe, would put a very different face on the matter.

If sanitary law is to be worth anything, it must be placed on the same basis with criminal law, so far as the nature, if not the degree, of the punishment is concerned.

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"SHOULD MEDICAL COLLEGES BE REQUIRED TO DEVOTE AN ADEQUATE TIME TO INSTRUCTION IN HYGIENE, AND EXACT OF CANDIDATES FOR THE DEGREE OF DOCTOR OF MEDICINE AN EXAMINATION IN THIS BRANCH OF MEDICAL EDUCATION?"

The discussion was opened by Dr. Richard H. Lewis, of North Carolina, as follows:

Mr. President and Gentlemen: When I received notice from the secretary of this body that I had been appointed to open the discussion on the question, "Should medical colleges be required to devote

an adequate time to instruction in hygiene, and exact of candidates for the degree of Doctor of Medicine an examination in this branch of medical education?" I was sincerely surprised. At the same time, as a patriotic North Carolinian, I was gratified at the reason assigned for the selection of so humble an instrument, viz.: that our state was a pioneer in such matters. I must, however, disclaim any particular credit for North Carolina, so far as making any special effort for better education in hygiene is concerned. If I am rightly informed, to Illinois, in the person of our late friend and associate, Dr. Rauch, that honor chiefly belongs. But I am constrained to confess that we are proud of the fact, which is well known, that in the matter of elevating the standard of general medical education, by the enactment of a practical license law, North Carolina was the pioneer; and I am glad to add that she continues to march in the front rank.

The subject before us, Mr. President, is, by odds, the most important on the program. Every other question proposed represents some particular part of the superstructure of hygiene, while this is the very bed-rock upon which applied sanitation rests—and merely theoretical or unapplied sanitation is of no practical value. The fact is, gentlemen, that the answer to this question is so plain, so irresistibly self-evident, that I feel positively embarrassed, lest, in arguing in its support, I insult your intelligence. You will, therefore, pardon me if I appear to be elementary.

It is a well-established fact, which no man of experience will deny, that no law, unless supported by public opinion, can be enforced—certainly in this free country of ours. The opinions of the people on any subject are controlled by the attitude of trusted leaders, in whose knowledge of that particular matter they believe. No class of men have the confidence of the masses of the people in most matters, but especially in all relating to medicine, to the same degree, as the family physicians of our country. Disease being a departure from health, the proper study of disease implies a study of the laws of health. Every man of common sense assumes that his physician is familiar with these laws. If he hears nothing of them from him, he takes it for granted that they are of no especial importance and consequently, instruction from others of as little, or less, authority, in his opinion makes no impression. It is through the medical advisor, therefore, chiefly, that a public opinion in support of the practical application and enforcement of the laws of hygiene must be built up. But it is a lamentable fact that the attitude of the profession generally to this most important subject is one of cold indifference. Indeed, it sometimes happens, I am informed, in individual cases—rare, let us hope, for the honor of our

profession—that the attending physician, in order to conciliate a paying patron will actually countenance a deliberate violation of the plainest rules for the prevention of the spread of contagious diseases—and for no better reason than that his client is not willing to be put to a little temporary inconvenience for the sake of the health and lives, often, of his neighbors. Now, what is the explanation of this state of affairs? In my humble judgment, it is attributable, mainly, to a want of proper instruction during the formative period in their medical lives. “Train up a child in the way he should go, and when he is old he will not depart from it,” is a proverb of the wisest of men, which applies with equal force to the education of physicians. The neglect of this early training is doubtless the chief cause of the indifference to the claims of sanitary science of which we complain in so many of the medical men now in the field.

If hygiene be given a dignified position in the curricula, and its great importance be properly emphasized, there can be no question as to the good it would accomplish in the coming generation. It would not only redound greatly to the welfare of the people, but it would have an elevating effect upon the profession itself, by impressing the philanthropic aspect of the calling which we are in the habit of referring to with pride as “noble”—improperly, we must admit, if we take the merely commercial view of it—if we value it simply for the money there is in it.

I regret that I am not informed as to the extent to which hygiene is taught in all our medical colleges; but from what I do know I feel that I am safe in saying, outside of a very few of the very best, the subject is practically ignored. That this condition of affairs should not be allowed to continue, if it can be prevented, needs no further argument. As guardians of the public health it is plainly our duty to see that it is done. We have it in our power to do it. In many of the states the state board of health and the examining board are one and the same. If these boards alone will unite in demanding of the medical colleges sufficient instruction in hygiene, and will require of every applicant for license satisfactory evidence that he has received and profited by it, the matter will be settled. Of course, the desired result would be obtained more quickly and more completely by an advance all along the line. In those states where the two boards referred to are separate and independent of one another, the board of health should exert itself to interest the board of examiners, particularly, and the profession, generally, in the subject. As bearing upon this point, and as a fitting conclusion of what I have to say, I will take the liberty of quoting—what some of you may have seen—an editorial entitled “Hygiene in Medical Education,” which appeared in the June number of the *Bulletin*

of the North Carolina Board of Health, showing what has been done on this line in our state. It is as follows:

### Hygiene in Medical Education.

"At the recent conjoint session of the State Board of Health and the State Medical Society, the following resolutions were unanimously adopted:

"Resolved, That the medical colleges of the country be requested to give to the subject of hygiene sufficient time for thorough instruction of their students on that subject—not less than two lectures a week.

"Resolved further, That our board of medical examiners are hereby requested to require of applicants for license the same preparation on this as on the other branches of medicine named in the Medical Practice Act.

"Resolutions similar to these were adopted not long since by the State Board of Health of Ohio, and perhaps other boards of health have done the same thing, but so far as we know this is the first instance in which the organized medical profession of a state has joined in such action. It is significant of the progressive spirit that animates the profession in North Carolina. The importance of having the medical colleges pay more attention to hygiene than most of them do is apparent. Every physician who does his whole duty is necessarily a health officer. His noble mission is to save from sickness and death. In no way can he accomplish so much as by the inculcation and moral enforcement of true sanitary principles. No matter how well organized a health department may be, nor how competent the legal health officer, satisfactory results in preventive medicine cannot be obtained without the cordial cooperation of the attending physician. If this is true and we do not suppose any one will controvert it the fact is a lamentable one that so many of us manifest such a degree of indifference to practical hygiene. As we have remarked in a former number of the Bulletin this fact is inexplicable to us or has been, but we think we see light. 'As the twig is bent the tree's inclined.' In our medical childhood, while under tutors and governors, we were not sufficiently instructed in hygiene, our minds were not inclined in that direction. This most important subject was, in the medical education of many of us, entirely ignored or belittled, by the meager attention it received. And we believe this is the principal reason that so many physicians, admirably equipped in every other respect, are so strangely indifferent to the claims of sanitation.

"If our board of medical examiners accedes to the request made in the second resolution, and we believe it will for the reason that

it is composed of men who represent the progressive element in the society), we shall feel hopeful of a goodly yield of fruit from the first resolution. None of our readers not thoroughly familiar with medical matters in North Carolina can fully appreciate what a power the board of medical examiners has been in promoting higher medical education. It has, with its absolute independence under our admirable law and its high standard of 80 per cent., with the help, particularly, of the Virginia board since its more recent establishment—to express it badly—forced the colleges chiefly patronized by North Carolina students to do better. We know that some time before the Virginia license law was passed one of these institutions informed its students from North Carolina that they would have to stand a more rigid examination than the other members of the class, because of the state examination that awaited them. If our board and those of the other states join in this movement it will not be many years before preventative medicine will be better taught in our medical colleges, and our physicians, having a more thorough knowledge of the subject, and a clearer idea of its importance, will give it, in their daily practice the attention it certainly deserves.”

Dr. Probst: Mr. President, every state and every municipal health officer who has been in the service any length of time, has had brought home to him the necessity for giving to our physicians better instructions in hygiene; and every one, familiar with medical instruction in our colleges is aware that the majority of these pay but little attention to the subject. Hygiene is taught because some of the medical licensing boards refuse to recognize diplomas unless this subject is included in the curriculum; but in many, perhaps the majority of colleges, no examination in hygiene is held, and in some, all the instruction given during the whole term required for graduation is comprised in three or four lectures delivered by one holding another chair, and without special interest in the subject. We all know how little attention is given to a subject by medical students when it is known they are not to be examined.

Some months ago a letter was addressed to each medical examining and licensing board in the United States requesting information as to their requirements in regard to hygiene, and asking whether it was considered advisable and practicable for such boards to require a definite and suitable amount of time to be given to instructions in hygiene with an examination of graduates.

This question was answered in the affirmative by nearly all of the correspondents. Answers were received from Alabama, California, Colorado, Connecticut, Illinois, Iowa, Kentucky, Maryland,

Missouri, New Jersey, New York, North Carolina, North Dakota, Pennsylvania, Texas, Washington and West Virginia.

In Alabama, Maryland, New Jersey, New York, North Carolina, North Dakota, Pennsylvania and Washington diplomas are not recognized; an examination being required, and hygiene is one of the subjects for examination.

I am not able to speak positively, but have been led to believe from information received from various sources, that the examinations in this subject by many of these boards are far from rigid.

In California, Colorado, Connecticut, Illinois, Iowa, Kentucky, Missouri, Texas and West Virginia, diplomas are recognized. In California, Connecticut, Iowa, Texas and West Virginia no requirement is made that hygiene shall be taught in medical colleges in order to be considered in good standing, and in none of these states where diplomas admit to practice is there a minimum requirement as to sanitary instruction.

Physicians in their respective communities are looked up to as authority in all matters relating to health; and if they are in fact entirely ignorant of sanitary matters they will often defeat the best efforts of boards of health.

One of our medical colleges is about to establish the degree of Doctor of Public Health. This movement should be urged forward; and in time we may be able to say that our health officers shall be taken from among those only who have received this degree.

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**"SHALL THE STATE MAINTAIN SUPERVISION OF THE PROPAGATION OF VACCINE VIRUS?"**

The discussion was opened by Dr. J. W. Scott, of Illinois, as follows:

The majority of the profession and the majority of the public are at one, in a general way, as to the merits of vaccination. The courts now refuse to listen to adverse discussion, asserting that the question has been affirmatively adjudicated by science and that nothing remains to be said for the guidance of the bench. This affirmative judgment of the public and the professions is based, of course, upon the gross results of the century's experience with smallpox—comparing its prevalence and fatality at the present time with the prevalence and fatality in the pre-Jennerian period, and comparing the mortality of unmodified smallpox with that of smallpox modified by vaccination. It is the common-sense verdict of the great majority. The "vox populi," which is said to be the "vox dei."

Nevertheless it remains that, almost at the end of a hundred years of vaccination, the exact value of Jenner's discovery is not so fully determined as to exclude sturdy dispute by a minority, by no means insignificant, both of the profession and the public. The numerous and actively mischievous anti-vaccination leagues are but one form of expression of the denial of any value of the contrary: the prolonged existence of the Royal Commission on Vaccination which has held weekly sittings since 1889, has made its fourth formal report this year, without as yet expressing any opinion on the part of the commission itself, is a striking indication of the conflict of the evidence presented and of the difficulty of arriving at a conclusion based thereon; while the hostile attitude of such men as Prof. Cruikshank and others of acknowledged scientific ability and standing, is quite sufficient to account for the activity of the anti-vaccinationists and for the protracted deliberation of the Royal Commission.

As one of the foremost among the scientific opponents of vaccination, it seems worth while to rehearse briefly some of Cruikshank's latest utterances on this subject. He is Professor of Comparative Pathology and Bacteriology in King's College (London) and ranks high as a bacteriologist. He has made a special study of vaccine virus, the results of which study have led him to scout the idea that vaccination has any protective power against smallpox. In a recent inaugural address before the medical society of his college (October 26, 1894), he refers to vaccination as having been "adopted by a not very critical profession and by a confiding public ever craving for novelties and especially for new cures;" to the frequent recurring epidemics of smallpox, even since vaccination has been made compulsory—this, in proof that "vaccination is not capable of extirpating smallpox or of controlling epidemic waves of the disease;" to Haygarth's stamping-out plan, suggested about the middle of the last century, urging its adoption on the ground that a similar system whose principal features consist of isolation, disinfection and slaughter of the disease, has stamped out the three great animal pestilences—cattle plague, sheep-pox and foot-and-mouth disease—and maintains that "prompt isolation in the case of human smallpox is as efficacious in stopping the spread of the disease as the use of the pole-axe in cattle plague"—from which last quotation it is to be inferred that he does not absolutely insist on the necessity of killing a variolous victim, although that is an essential feature of the stamping-out of the animal plagues.

As to vaccination, it is, to his mind, only a question whether it confers even a "transient immunity or is of no more value than are 'issues' to protect against the plague." He has no faith in anything

concerning it as a measure of protection; his investigation of the sources of vaccine shows them to be "too varied to fit in with the hypothesis that vaccination can be in any way antagonistic to variola;" he claims to have found that these various vaccines "will produce on individuals of different ages and different conditions and nationalities no less than seventy varieties of marks;" in short, as the result of his scientific study, it is his opinion that the vaccine of the period is an undetermined and variable quantity, the effect of the use of which can not be foretold in any given case, and that "the compulsory inoculation of every member of the community with any kind of lymph for vaccine, is not only unnecessary, but wholly unjustifiable."

The publication (London *Lancet*, November 24, 1894), of Prof. Cruikshank's address is very timely for the purposes of this conference, and especially so for the discussion of the proposition by Wisconsin State Board of Health: "Shall the state exercise supervision over the propagation of vaccine virus?" The answer to the query is foreshadowed in that address; it is emphasized by this disclosure of the principal ground of opposition to vaccination. When a man of Cruikshank's scientific attainments, after prolonged and serious study and research arrives at the adverse conclusions which he has formally expressed before a learned society, it is quite time that health authorities and sanitarians address themselves to an investigation of the cause or causes and to measures for their removal.

It is hardly necessary to dwell upon the flaw in his argument—that it is a flagrant "petitio principii" to assume that vaccination is vaccination, no matter how performed nor with what material, that is undoubtedly, a flaw in the argument as an argument; but the fact remains that the profession and the public have come to regard anything as a vaccination in which the skin is abraded, no matter how, and something is rubbed on the abrasion, no matter what, so it is called vaccine.

It is not necessary to take any stock in newspaper stories of points dipped in a mixture of croton oil and egg albumen, gelatin or mucilage, but I presume every member present has duplicated my own experience in his examination of the vaccine points of commerce. A superficial inspection has frequently detected blood-stains and even grosser impurities, while the microscope has revealed the presence of corpuscular elements, blood and pus cells, etc., which are foreign to the pure lymph; and as to the technique of the operation itself, I know of nothing better calculated to bring vaccination into disrepute than the methods I have seen employed in some localities during the past year. Large, bleeding, surfaces, often produced by scraping, exposed to the microbe-laden atmosphere of a crowded



dispensary or vaccination bureau; a total disregard of the most ordinary, aseptic precautions, either before or after the operation; no adequate examination as to the condition of the subject, but an indiscriminate cutting, scraping or scratching of every individual presented, healthy or diseased, clean-skinned or exanthematous, pure-blooded or scrofulous or even syphilitic, for all the vaccinator had learned or knew. The wonder is not that undue inflammation, septic infection, erysipelas and other sequelae—undoubtedly destructive of vaccinal protection—occur occasionally, but that they occur so seldom and the curse of it all is that the unfortunate victim believes that he has been vaccinally protected, and when he comes down with the smallpox his large, unsightly cicatrix is cited as another proof of the failure of vaccination. In the last great epidemic of smallpox in Illinois, that of 1881 to 1883, the board was confronted with this difficulty, when it undertook to secure the vaccination of the public school children of the state: To what extent was it justifiable to compel vaccination, when even physicians, to say nothing with the laity, regarded the operation as a mere scratching of the skin, which any old woman of either sex could perform; when the majority of medical colleges regarded it as too insignificant to devote a single lecture to, and graduated men had never seen a vaccine vesicle, and above all, when the supply and quality of vaccine could not be controlled or regulated?

The veteran sanitarian, Dr. Elisha Harris, had already offered the following proposition, which it is the duty of the state to secure, before attempting to enforce compulsory vaccination:

I. "That the quality of the vaccine lymph shall be absolutely perfect, and that the insuring of this uniform excellence shall not be subject to uncertainty or any kind of capricious judgment (or commercial exigencies).

II. "No barriers of poverty, ignorance or the inaccessibility of means shall prevent the administration of the vaccination which each child needs.

III. "That every parent and custodian of children, and every other person susceptible to smallpox, and every medical practitioner, shall, by timely and adequate provision of the state and local sanitary authorities, be wholly without excuse for failing to have conveniently accessible the needed supply of perfect vaccine virus, and whatever is needed in the nature of information, instruction and a personal record.

IV. "That whatever is ordered or required by the public authorities to be performed in respect of vaccination, the laws should enable and require the same authorities to insure being performed, and should give to the people, as well as to the authorities, such

necessary means of information and instruction as shall suitably prepare them to understand and perform their duties."

Based upon these propositions and upon their application to existing conditions, the board arrived at certain conclusions which it formulated under twelve separate heads. The fourth of these conclusions seems to me to cover the whole scope of the questions under discussion and to furnish its conclusive answer. It is as follows:

"The encouragement of official supervision of the supply of vaccine material which shall be kept continually under a system of registered observation and testing for the maintenance of the perfection of its qualities, is plainly a duty of the first importance; and wherever a state board of health is formed, or a municipal sanitary board is endowed with sufficient authority and means, it should maintain or at least supervise such a system of vaccinal supply. It is by no means necessary to wait for the organization and development of a complete sanitary system, nor for the perfection of birth registry, before providing a perfect standard and a public supply of vaccinal lymph."

I will only add that the present board has taken action upon this conclusion, arrived at by its predecessor a dozen years ago, and will ask the General Assembly at its forthcoming session for an appropriation to enable it to provide "a perfect standard and a public supply of vaccinal lymph" as one of the most important duties imposed by its organic law—the preservation and improvement of the interests of the health and life of the citizens of the state.

Dr. Wingate: Mr. President, the Wisconsin State Board of Health suggested this subject for discussion for the reason that it wanted an expression of opinion from this body in relation to this matter.

Some time ago the secretary of that board was authorized to investigate the vaccine supplies that came to that state, and to make some report on the subject. That report has been deferred until after the meeting of this body, so as to make as complete a report as possible, and I hope it will be discussed at length. I hope we will have the opinion expressed of everyone present.

I have taken some little pains to ascertain the number of vaccine stations in the country. I have written to all of the secretaries of state boards, and have received replies from nearly all of them, and perhaps it might be interesting to run over them.

In Alabama there are no propagators in the state; Wisconsin, one; California, one, this being in control of the State Board of Health, and the secretary considers it a dead letter; Colorado, none; Kentucky, none; Delaware, none; Florida, none. From Illinois I did not receive a report.

A Member: There are two in that state.

Dr. Wingate: Idaho, none; Kansas, Louisiana, none; Maine, none, but the State Board of Health authorized an inspection of vaccine supplies; Maryland, one, but there is no satisfactory work of inspection; Massachusetts, one—a crude law was passed giving the State Board of Health a sort of supervision, but no penalty for an infraction of the law; Michigan, none; Minnesota, one, conducted under the supervision of the secretary of the State Board of Health; Mississippi, none; Missouri, two; Nebraska, none; Nevada, none; New Jersey, one; New York, one, under the city department; North Carolina, none; North Dakota, one, conducted by the state health officer; Ohio, none; Oklahoma, none; Pennsylvania, two; Rhode Island, none; South Carolina, not heard from; Tennessee, none, but the report states that the propagation will be placed under state control if a station is operated; Texas, none; Vermont, none; Washington, none; West Virginia, none; Wisconsin, four, and the District of Columbia, one, making a total of nineteen vaccine stations in the country, so far as heard from.

We have in our state four stations propagating virus. Two of them are very small, and two are doing a considerable business. It seems to me a very important matter that this conference should take united action on this question, and of course whatever this body may do will have great weight in influencing any attempted legislation by other states. If that can be done, a great deal will be done to protect those who are propagating pure virus, and to weed out those who are not. The commercial element in this matter is fraught with the greatest danger. I will refrain from saying anything further until some other discussion may bring out further points.

Dr. Swarts: I am glad the question has been brought up, for some consideration ought to be given to it in the way of agreeing on some method for the control of virus as it is produced. That is to control the farms owned by states, or where the state does not own the farm it should control the supplies, from a commercial standpoint. I think that all virus ought to be condemned where an inspection shows that aseptic precautions, and all possible precautions, are not observed. It has become necessary with us that the secretary shall recommend or approve the virus used in our state.

We have had on our statutes for twenty years vaccination among the public school children, but we should and must put ourselves in a position to see that all virus is properly inspected. I would like to have the consensus of opinion as to what is the best method to be adopted to carry out this view. I have inspected the farms which supply the virus to the state of Rhode Island, except the

Lancaster supply. The one which I have not inspected in New England is the vaccine at Chelsea, because it is now out of the business. The New England farm is conducted with good methods. The surroundings and accommodations for animals are good, but the method of charging the points is not good. It is evident that to obtain the best results we must not only see that the vesicles, etc., are in good condition, but we must understand the technique and other little things which, if ignored, would allow impurities to creep in. A proper observance of these would prevent the introduction of impurities into the matter used.

One point to which I would like to call your attention is that the New England farms charge the points twice. They claim that the second protects the first.

I would like to have this discussed very freely, so that we may learn something from what is said. If you should have an epidemic of smallpox, you would wish to have some such expression.

Dr. Cochran: With regard to the question which was treated of by the latter gentleman, I have to say that whether the state should sustain vaccine farms or not depends on the state. It might be a good and very wise provision in Illinois or other states where there is a large population, and where there is a considerable prevalence of smallpox to be treated. I am sure that many of the smaller states are under no necessity at all of maintaining vaccine farms, or providing any means for the propagation of the points.

In Alabama we do not have any smallpox. Occasionally a case comes there and we send off here to Washington and get vaccine from Dr. Walsh. These isolated cases we have not had very often, perhaps once in nineteen or twenty years.

Now, I want to say that all this minute attention to detail is of very little importance. Septicism has run mad amongst us. I believe in reasonable attention to cleanliness. I do not think that a little blood or pus mixed with the vaccine point taken from the cow is likely to produce any damage to the person who is vaccinated. There have been variations in regard to vaccination. For a great many years the custom was to take humanized lymph from the vaccinated arm and use it on other subjects. Some years ago the idea of using bovine matter came into fashion.

Now, for myself, I have had a great deal of experience during the war, about thirty years ago, in Alabama, and I deliberately reached the conclusion that for meeting the exigencies of a prevailing epidemic the best vaccine was the humanized crust.

The President: That was all we had before the war.

Dr. Cochran: Yes, while I would take all reasonable precautions to see that the crust was from a healthy subject, still I believe the lymph from the arm of a syphilitic subject may be safely used

for vaccination without the danger of communicating syphilis. If you used the actual pus and blood you might communicate syphilis, and it does seem that it has been communicated in the process of vaccination. I believe such cases have occurred, but I do not know of my own knowledge.

The vaccine vesicle is a growth, and it feeds on the tissues in which it is implanted. The vesicle, as I read lately in a work on physiology, is composed of cells and lymph. It does not pass through a pustular state at all. The crust is translucent and the depth of its coloring depends on the color of the subject from which it is taken. I can take a vaccine point and tell you whether it came from a blonde or a brunette; a white man or a negro.

I hold that the crust is just as safe, so far as the danger from communicable diseases is concerned, as the lymph from the cow, and I hold that it protects the person quite as well. It is more certain to take and the soreness sometimes is less severe, I think I may say as a rule. And again, when you want them they are much easier to get. We sometimes use, when we need any vaccine at all, the bovine virus, because it is convenient; but when we get a few points of bovine virus and inoculate children a great many people take advantage of it and are vaccinated from the crust formed in these cases.

We did not recommend to our Legislature to pass a compulsory vaccination law, for the danger from smallpox is too small to make it worth while to recommend such action, for it makes its appearance very seldom.

Dr. Lachapelle: Mr. President, if I understand well the question which is before this conference, it is not to know whether each state should have a vaccine farm under the control of the state board of health, but whether, when there is a vaccine farm it ought to be under the control of such state boards. I, for one, think that when there is a vaccine farm it ought to be under such control. It is too important a matter to be left in the hands of private individuals who may be willing to make a speculation out of their enterprise. To deny the importance of the precautions that ought to be taken in such cases is to forget or ignore modern surgery. When you compare the results of the modern surgeon with those of twenty-five years ago, everyone is obliged to admit that there is all the difference in the world; and that this difference is only due to aseptic precautions, and vaccination is a surgical operation.

I think besides that each state board of health should not only have control of the farm, but that printed regulations should be supplied with the vaccine, so that the physician should know how to vaccinate. If the vaccine is bad, no matter how well the vaccination may be done, you may have blood poisoning. If the vaccine

is pure, and if the vaccination is septic, you may still have bad results, because it requires a very little sore and a very little opening in the skin to have an absorption of poisonous matter and consequent bad results. I consider that there ought to be written directions, so that each physician should know how to vaccinate aseptically, how to prepare the skin, how to make the abrasions, and how to dress the little sore spot. If all these precautions are taken I think there would not be any evil consequences. There would be no danger, and the faith of the public would not be shaken at all.

In our province we have a vaccine farm which was a private undertaking and which received a subsidy from the government. A few months ago the government insisted that we should take it under control. I hesitated because it was out of our supervision, as it was near Quebec and we were near Montreal.

Now, I have a veterinary surgeon appointed to inspect each calf before the inoculation, and during the period of the incubation of the virus, and I have one member of the profession in Quebec paid specially to make visits at least once a week. Besides we have a bacteriological agent with proper apparatus with which he makes examinations. This, however, as I say, has only been since a few months, and so I am not ready to make you a report on the results. We are working very carefully, and I would not give you a report approving or commending the farm until I am perfectly well satisfied of its results. But I hope that we will be able to bring this farm up to what it ought to be.

I think it is our duty and the duty of each state where there is a vaccine farm to have state control over it and do what ought to be done to make the control effective, and to give to the public the assurance and certainty that everything is all right.

I think this is one of our most important duties so long as we think vaccination is necessary. We ought to have the responsibility of the control and never allow any commercial or private undertaking to try to make money perhaps at the expense of the public health.

**Dr. Lee:** I wish to express my entire accord with the views of the gentleman who has just spoken and to further them, briefly, I offer these propositions: First, that vaccination is a surgical operation; second, like all such operations, it should be performed with aseptic precautions. Then I would like to add a third as a corollary, that it should be only performed by an individual who understands what antiseptic precautions are, or by a regularly educated physician.

**Dr. Ruggles:** I have listened with a great deal of interest to the discussion or talk in relation to this subject. As I have stated, I am the health officer and have had the entire charge of the smallpox

for 26 years in California—that is, in my locality. Therefore, my attention has been directed to this very subject. The question in regard to the state is a matter of no great importance, although it is best, perhaps, that someone should be responsible for the purity of the article, whether it comes from Rhode Island, Alabama or any place else.

I know from experience that some of the matter I have used produced bad results, and that was by the impurity of the virus. I am quite sure that I would not like to have that repeated.

My contention has always been that if the commonwealth insists upon it that children be vaccinated, then there is placed upon it the obligation to assure the efficiency of the work, and that it should be as safe as human skill can make it. I am sure that we have been using matter that is faulty and dangerous. I have seen results from all vaccine farms which were serious in the destruction of tissues and the poison of the system. In other words, they have done more harm than good; of course, a certain part of that may be on account of the lack of skill in the operator. Dr. Swarts holds that only a physician should perform the operation, but I am not quite so certain about the necessity of that.

Perhaps all of us who have been connected with hospitals or commissions know that there are men who can perform certain operations with as much skill and with as safe a touch as those attached to the force. In fact, in Germany some of the public vaccinators are not physicians. The essential seems to be that the skin is properly cleaned before the incision is made, and that the persons who introduce it should have pure matter or as nearly pure as possible; and this may be secured by insisting upon proper methods being adopted by every vaccine propagator.

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PROCEEDINGS OF THE MEETING OF THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH HELD AT CHICAGO, JUNE 10, 11 AND 12, 1895.

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The conference met at ten o'clock A. M. June 10.

The meeting was called to order by Dr. J. N. Taylor, of Indiana, President.

The members present were from:

Alabama—Dr. Jerome Cochran.

California—Dr. C. A. Ruggles.  
Colorado—Dr. Henry A. Sewell.  
Connecticut—Dr. C. A. Lindsley.  
Illinois—Dr. J. W. Scott, Dr. Sarah Hackett Stevenson, Dr. Daniel P. Brower, Dr. William E. Quine.  
Indiana—Dr. J. N. Taylor, Dr. J. N. Hurty, Dr. J. L. Whitesides.  
Iowa—Dr. J. A. Scroggs, Dr. E. A. Guilbert.  
Maryland—Dr. James A. Steuart.  
Michigan—Dr. Henry B. Baker.  
Minnesota—Dr. C. N. Hewitt.  
Missouri—Dr. F. J. Lutz.  
New Jersey—Dr. Henry Mitchell.  
North Carolina—Dr. Richard H. Lewis, Dr. George Gillet Thomas.  
Ohio—Dr. C. O. Probst, Mr. Josiah Hartzell.  
Ontario—Dr. Peter H. Bryce.  
Pennsylvania—Dr. Benjamin Lee.  
Quebec—Dr. E. P. Lachapelle.  
Rhode Island—Dr. Gardner T. Swarts.  
South Carolina—Dr. James Evans.  
Wisconsin—Dr. Charles H. Marquardt.

Addresses of welcome were made by Hon. John P. Altgeld, Governor of Illinois, and Hon. George B. Swift, Mayor of Chicago, and were appropriately responded to by Dr. J. N. Taylor, of Indiana, the president.

The report of committee of conference of State boards of health on vaccine farms was then presented by Dr. Gardner T. Swarts, chairman.

At the last annual meeting of the National Conference of State Boards of Health, held at Washington, December 12-14, 1894, a committee was appointed to examine, inspect and report upon the conditions found at the various farms producing vaccine virus, to formulate such requirements as would seem most desirable in the production of this material, and to report at the next annual meeting; and also to make preliminary reports from time to time to the Monthly Bulletin of the state board of Rhode Island. This committee consisted of Dr. G. T. Swarts, secretary of the Rhode Island board, Dr. J. W. Scott, secretary of the Illinois board, and Dr. U. O. B. Wingate, secretary of the Wisconsin board.

The method proposed by the committee was to inspect personally every farm producing vaccine virus, within the immediate vicinity of the members of the committee. When the farms were remote, to obtain, if possible, a report from the board which is nearest the farm, the report being a result of a recent inspection and attention being given to all the details of the operation and conforming as far as possible to the same lines of investigation.



For this purpose the committee requested that all inspections be made with a view to determining to following conditions:

1. Name of farm.
2. Owner and name of operator.
3. Location—address and where stables are located, including character of the surrounding country; whether sparsely or closely settled.
4. Description of the incubation stables.
5. Description of the operating stable.
6. Character of inspection given by veterinary to the animals selected.
7. Age of animals used.
8. Locality from where the animals are obtained.
9. Point of selection for vaccination.
10. Area of each scarification.
11. How scarified; is blood drawn, is the surface abraded or only incised?
12. How is the wound cleansed before vaccination?
13. In what way is the animal restrained while being operated upon?
14. What precautions for sepsis are taken by the operator?
15. On what day is the serum collected?
16. How long does it take for maturity of the vesicle?
17. Upon what physical appearance does the operator depend to determine the proper stage for collection.
18. Character and color of crust removed and how removed; with or without violence to the parts.
19. How is the surface cleansed before collecting?
20. What is the character of the material collected for the seed points?
21. Are crusts ever used for seeding?
22. How are the points prepared and how handled? Are they charged by pressure upon the wound or is the serum transferred with some instrument?
23. In what form of covering are the points shipped?
24. Are the crusts sold or preserved?
25. Is the serum sold in fluid form?
26. Is any bacteriological control given to the points or the serum?

By following a formula of this kind the inspections can be made uniform and no points left out at the time of inspection.

The following farm was inspected by the members of the committee and some other members of the Association on December 15, 1894.

### The National Vaccine Establishment.

The office of this farm is at 1504 H street, N. W., Washington, D. C., and is under the superintendence of Dr. Ralph Walsh. The immediate supervision and operation of vaccination of the animals, and charging the points, is attended to by Dr. W. F. Elgin.

The stables are located in Maryland, just over the line from Georgetown, near Washington. The location is on a very high plateau overlooking the Capitol; is dry and in a sparsely settled farming country.

In the incubating or waiting stables the structure is of wood, the insides unsealed and whitewashed. The floor is cemented. No bedding is used. The vaccinating room is a warm, well lighted, wooden structure, with whitewashed wooden sides and wooden floor. The exclusion of flies in summer is effected by screening in windows.

The animals used are inspected by the operating surgeon. Those preferred are not over two years of age nor under six months. They are obtained direct from the farmers in the vicinity and the herd from which they are taken is known.

The joint selected for vaccination is on the buttocks, on both sides and quite near the spine. The area prepared for vaccination is about six by twelve inches, and the area of each scarification is about four inches square.

The animal is under no restraint while being operated upon, being upon the feet and held in a stall so arranged as to prevent freedom of movement of the head, but allows of slight movement of the body.

The hands of the operator are thoroughly scrubbed and cleansed with soap and water, and the instruments are washed in the same way. The operator wears a clean linen apron.

The serum is removed from the vesicle on the fifth day. The vesicle matures more rapidly in summer than in winter.

The vesicle or inspissated serum, forming an amber and yellow crust and which is quite adherent, and lays very flat, is removed by an ordinary flat-bladed knife, and the surface scraped with the edge of the knife to remove any small adherent particles from the wound. The surface presents a whitish-yellow appearance, upon which the exuding serum begins to form, looking like a layer of dew. As soon as this has exuded sufficiently the large seed points, which are four inches long and five-eighths wide, are pressed upon the wound and a large number prepared for subsequent vaccinations upon other animals. The surface is thoroughly and softly washed with boiled water, no sponges being used. In place of the sponge, absorbent cotton is used, which is thrown away after passing over the wound once and a new piece is taken. The serum is placed upon the points in the following manner: The points are first sterilized by boiling

This tends to soften them somewhat, and they are again sterilized by being placed in boiling water for one hour and then dried in the oven. The points are placed with clean hands in a clamp, which binds them by the base, the points being left free; about fifty points to the clamp. The serum is taken from the wound by pressing the wound slightly with a sweeping motion over the whole surface, and the serum gathered upon a camels hair brush of about six-eighths of an inch breadth, and the serum is painted upon the ends of the points. The clamps are placed to one side and allowed to dry. The points are then dropped into a clean sheet of paper and poured into sterilized glass jars and sealed up from moisture. At no point in the operation from the time of placing the points in the clamps to the time of placing the points in the shipping envelopes are the points touched with the hands. This precludes the possibility of the operator inoculating the points with dirt or soiling of the hand, which might occur in the operating room either by accidentally handling the animal or any of the instruments, towels or clothing.

The envelope consists of a paste-board outside with a lining of rubber gauze or tissue. Upon this tissue and adhering to it is a double layer of heavy tissue paper with pockets, into which the points are pushed, and which, when folded up with five points upon each side, is intended to preserve the points from moisture. An advantage claimed in addition to this is that the dispenser or retailer of the points, can, with a pair of scissors, cut off a section of the envelope containing one or more points without handling the point or removing it from its original seal. This assists in preventing the druggist from handling the points with hands which have just come from mixing some irritable compounds or handling some dirty substance, and the point is not removed from its case until the physician removes it directly to the wound. The only point in the whole operation where the points are handled, from the time of placing them in the clamp to the time of vaccination of the person, is when the points are placed in the envelopes by the packers. This brings the vesicle of the animal direct to the point of vaccination.

As soon as the wound shows a tendency to glaze over by the drying of the serum, the vesicle is abandoned and another crust removed.

No crusts are sold or preserved. No fluid lymph is at present placed upon the market, but arrangements are being made to provide this for shipment into foreign countries, and for selling a larger amount in bulk than would be contained upon a point.

The following farm was inspected by Dr. Lee, of the Pennsylvania board, and Dr. Swarts, of the Rhode Island board, December 15, 1894:

### The Lancaster County Vaccine Farms.

The principal farm of this company is located in Marietta, a small town about three hours' ride by rail from Philadelphia, in Lancaster county, Pennsylvania. It is situated in a fertile valley upon the Susquehanna river, and is not closely settled. A second farm is in operation in Omaha, Nebraska.

The incubation stable is a large, airy, well lighted room, in a wooden building with painted walls, and heated by steam. The capacity of this stable is one hundred head of calves. The whole is heated by steam. The floors are of concrete, the moisture from the droppings being absorbed by free use of German peat moss. Dry straw is used as bedding. Hard wood stanchions, admitting of free movement of the head of the animal, are used. The drinking troughs are continuous from one end of the line of stanchions to the other and are always sponged out after the animals have been watered. The barn litter is thrown into a large pit outside the stable and sprinkled freely with lime.

A systematic record of each operation is kept, giving the number of the check which is attached to the animal, the owner's name, when received, age, condition of animal, by whom vaccinated, date of vaccination, from what yield vaccinated, date of return of animal, cost of rental, and amount of collections.

In the vaccinating room the floors are of wood and perfectly dry. Cement floors have been used and given up on account of the absorption of moisture, the consequent dampness being injurious to the points. Beneath this room are the boilers for heating the establishment. The walls are sealed about five feet up and the rest of the walls are hard finished and painted. The whole is then varnished. The floors are kept clean with hose and frequent washings, although very little dirt comes to the floors except from the occasional droppings of the animal being operated upon, which are received in a tinned and painted gutter behind the operating racks. These are immediately swept up and removed from the room. Flies are excluded in the summer time by darkening the room with dark screens over the windows and creating a draft through the room towards a point of light by aid of fans run by water motors.

The animals are obtained from throughout the immediate country, and are hired; not bought and sold. The genealogy of the animal is known perhaps for several generations, the same farmers supplying the demand. In this way the history of the animal is known before the vaccination and the animal is not lost sight of afterwards.

The age of the animal preferred is over one year and not over two years.

The point of area of vaccination selected is on the inner surface

of the thighs. This point is preferred as being less liable to contamination when the animal lays down, and the resulting vesicles are found to be less liable to rupture. The size of the scarification is about the area of a twenty-five cent piece to a half dollar. The surface is first abraded with the edge of the knife, and the scarifications are made at right angles over the whole abraded surface, considerable blood being drawn. The blood has ceased to flow and the serum has formed before the inoculation is made.

The points are charged on the sixth or seventh day, when the temperature has reached its height and the vesicle is inflamed.

The crusts are lifted or picked off. As little disturbance of the raw surface is made as possible. The crusts are not cut or scraped off. The exudation from surface is collected upon the ivory points with a camel's hair brush, the brush being touched only by the serum and absorbing the serum from the surface, and is not brushed over the wound. The points have previously been sterilized by being passed through boiling water, then dried at — degrees Fahrenheit, and then heated by pouring alcohol upon the points and burning to dryness. The points are placed in clamps about eighteen inches in length before going to the operating room, and the points are not touched again with the hands until packed. The collection of the serum is discontinued as soon as it ceases to exude.

The same care is exercised in the production of the seed points as with the small points.

In addition to ivory points, crusts, and fluid serum in capillary tubes, and preserved with glycerine, are supplied to the market.

The points are dispensed in metallic tubes, ten in a tube.

The following farm was inspected by Dr. Swarts, May, 1894. The same has been since inspected by the State Board of Health of Massachusetts.

New England Vaccine Co., Chelsea, Mass., Dr. Wm. C. Cutler.

The offices of this company are located at 294 Broadway, Chelsea, and the stables are located in Everett street, away from the thickly settled portion of the city. The stables were built especially for the purpose for which they are used and consist of two large high-studded apartments. The one used for the stable has cemented floor, a mop-board of wood rises to the height of four feet, the rest of the walls are hard finished and painted; the stanchions are of hard wood and iron piping. No straw or bedding is used. A cemented depression of the floor, or trench, a foot wide and a foot deep is located behind the animals, and all droppings fall into it; numerous faucets and a line of hose permit of frequent thorough flushings.

In the vaccinating room the floor is of cement; the walls glazed

rile for six feet, and the rest of the room hard finished and painted. The intention of perfect cleanliness is manifested in the equipment. The whole is heated by steam.

The animals are selected and examined by a veterinary surgeon, a certificate of health being issued to each one by number before being treated. The animal is tagged with this number and the points charged take the same number. It is the intention that this tag shall not be removed until the animal is killed, thus a complete record can be kept of the whole proceeding in each animal, and if when slaughtered it is found to be diseased, the points bearing that number can be destroyed.

The animals preferred are not under one nor over four years of age. It is frequently difficult to obtain as many heifers of the proper age as is necessary for the supply.

The point of vaccination is selected on the buttocks on both sides. This is preferred to the abdomen on account of non-liability of rupturing the vesicle when lying down and on account of greater cleanliness of the parts.

The area of each scarification is about the size of a silver dollar. Large scarifications are preferred on account of there being less tension in the vesicle and the walls of the vesicle being held more firmly to the skin by numerous trabeculae.

The serum is taken from the vesicle about the seventh day. This is a matter which depends more upon the progress of the lesion than any limited time.

When the lesion is ripe or in a suitable condition, the crust is cut or scraped off, leaving a raw surface which at first has fine, small bloody points, and some serum. This with any particles of the remaining crust are sponged off with clean sponge and water. After a few moments the virus exudes and is taken direct upon the ivory points by touching the tips of the points to the exuding serum on the wound.

The points are handled with the fingers of the operator and are placed on metal trays in a gauze wire cage, to dry. When dry they are again dipped, it being considered that the second coating protects the first to a certain extent.

The ivory points are sterilized before being used by long continued boiling.

When all points are charged and dried, they are placed in glass jars, labeled with the number of the animal from which they were taken and forwarded to the office of the company where lady assistants remove all particles of extraneous matter and exclude all imperfect points before packing for shipment.

Large Ivory points are charged with the first oozing from the wound and although they may be stained with some blood, they

are preserved and used as seed points for vaccination of subsequent animals. Although all clean crusts are preserved for a time as a precaution against the failure of the seed points, yet none are sold.

#### Codman and Shurtliff Farm

Is located at Stoughton, near Canton, Mass., and is under the supervision of Dr. D. C. Rose, who personally examines each animal before vaccination. The inoculating room and stanchions are located in a barn in the country. The animals are allowed the advantages of an adjoining field until the vesicles are fully formed. They have the advantage of plenty of air and freedom from restraint during the incubation period. The animals are bedded with clean straw, and all droppings are swept through a chute and by means of wooden troughs below the floor, all urine and floor washings are removed at once.

The vaccine scarifications are made by preference on the lowest or posterior part of the abdomen, or upon the abdomen and buttock of only one side. The size of the scarifications are made not larger than a quarter of a dollar. Heifers not older than one year are selected for the work.

The charging room is perfectly clean, free from dust and very dry.

A special point is made in gathering the virus after the removal of the crust, in allowing the oozing serum to trickle into small glass cups especially prepared for the purpose and holding about a teaspoonful. Any extraneous matter, such as epithelial scales or bits of crust thus have an opportunity to precipitate before the points are dipped. Being dipped they are allowed to dry on clean glass plates. In spite of indignant demands of the medical profession for a supply of crusts from this source, none are sold as in former years, the management believing that the danger of pyogenic infection was thereby increased.

#### Humanized Virus.

The largest number of cases which are vaccinated at the public expense are in the city of Providence. Both bovine and humanized virus is used. The supply of bovine virus is obtained from the New England Vaccine Co.; the humanized supply is under direct control of the health department and has been for thirty-eight years, the material being propagated in a direct line from the original imported stock.

The virus is gathered by the vaccinating physician of the department, Dr. Charles H. Leonard and is taken from only such children as present an appearance of perfect health and whose parents are likewise found to be healthy.

Material in some cases is taken on points or quills, but the most of the material is preserved in the form of crusts. This, in the form of a powder, is mixed with tap water and a little glycerine.

It is customary to make these scarifications upon the left arm, the area being about the size of a dime.

No attempt is made to clean the arm before applying the virus, which is applied with the same spatula that has been rubbed upon the arm of the next preceding case.

That the virus is pure and that the danger of mixed infection from arm to arm is small, is evinced by the uniform favorable results, not only in the successful production of typical vesicles, but the freedom from violent results.

The use of humanized virus is preferred by the department, since from its experience the point of inoculation became less violently inflamed than with the bovine virus.

The following farm was inspected by Dr. Wingate of the Wisconsin board, December 8, 1894:

#### Minnesota Vaccine Station, Red Wing, Minn.

This station is under the absolute care and control of Dr. C. N. Hewitt, secretary of the State Board of Health, Minnesota. The station is located in a sparsely populated district, and its environment is especially favored with plenty of pure air. The incubation stables are kept absolutely clean and, at the time of my visit, contained eleven or twelve calves of common stock. These calves were from four to eight weeks old; none others are used in this station. The stalls are so arranged that they can be removed and cleansed, and the floors washed, and everything kept aseptic. Absorbent material is used to keep the stalls perfectly dry.

The operating room has hard wood floors and matched ceiling, and the floor and ceiling are washed and cleaned and kept as thoroughly aseptic as a surgeon's operating room. The taking of virus is under the personal observation of Dr. Hewitt, and the person doing the work or the doctor at the time assisting, is clothed with a gown which covers the outer clothing in a manner similar to that used by surgeons in performing a delicate operation. Prior to inoculation each animal is treated as one would treat a patient coming into an operating room. If he is dirty he passes through with a very complete antiseptic bath. It may consist of bi-chloride solution, boracic acid, or sterilized water, as in the opinion of the operator may be considered necessary. The calf is fed properly before the inoculation and allowed to remain in the stable for some little time in order to be accustomed to his surroundings. He is then taken into the operating room, laid upon his right side upon a table prepared for the purpose, the feet strapped down, and the upper side of the



abdomen washed with sterilized water, or bi-chloride solution if thought necessary, when the parts are lathered with shaving soap and shaved. With a dull lancet the operator then proceeds to make incisions over the shaved surface, about one inch long and from ninety to one hundred in number, covering a space of about eighteen inches square. These incisions are made just deep enough to draw a little blood, then they are inoculated with virus that has been taken from a calf that is already on the table and from which vaccine virus is being taken.

On the fifth, sixth or seventh day after this inoculation, the calf inoculated is placed upon the table again in the same position and the virus is taken. If there seems to be anything irregular or out of order, as sometimes happens, no virus is taken from such animal and the process is declared a failure. Every vesicle that results from the inoculation must be absolutely satisfactory to the operator or he will not use any virus from that source. If the calf presents a healthy and satisfactory appearance, and the typical vesicles of Jenner appear as results of the inoculation, the operator proceeds to take the virus after disinfecting his hands in alcohol and ether, clothing himself in aseptic clothing, and being sure that the operating room is in an aseptic condition. Sterilized water, or a weak solution of boracic acid, is used to cleanse the surface. Each vesicle then is taken up by a clamp made for the purpose which squeezes it slightly and the virus is taken on sterilized ivory points by pressing the point on the surface, one side only being used. There are no scabs at all. No virus is taken except from the vesicle which is as perfect as would be seen on the arm of an infant at the seventh or eighth day of a successful vaccination. The points after being taken are placed on a tray and then put in a sterilized cupboard to dry, then wrapped up in rice (?) paper, each being wrapped by itself. Dr. Hewitt makes a great point of watching each animal inoculated from beginning to end, and excluding any animal from use that has any appearance of suspicion. Unless he gets the typical vesicle of Jenner, in each case, he will not use the animal at all, and if these vesicles have passed on to the pustular stage he ceases all operations at once. He also believes that the virus should be continually watched, and frequent bacteriological examinations made, in order to be sure that no germs enter into the virus that may interfere with its action. He gives personal attention to every animal, being sure that the animal is healthy and that the inoculation is conducted properly, that the virus is taken properly, and that anything suspicious is excluded from the time the animal enters the stable until the operation is complete and the virus sent out. No crusts are ever used for seeding, no crusts are sold or preserved. The virus is not sold in fluid form. Frequent bacteriological examinations are made concerning the production.

In February, 1895, two stations were visited at Fond du Lac by Dr. Wingate. One was conducted by Dr. Beeson and the other by Dr. McNeel. Both propagators were endeavoring to acquire a certain amount of perfection, and expressed a willingness to comply with any rules or regulations which might be made by the State Board of Health. One of them made use of peroxide of hydrogen as a disinfectant to destroy any pus germs that might happen to be in the virus. The other used a solution of oxalic acid as a disinfectant just as he takes his virus.

Since the commencement of this work by your committee the State Board of Health of Pennsylvania has made personal investigations of all the farms in its own State as well as all others in the east and west. A report of the results of these inspections is expected to appear shortly and will be of much assistance and of more recent date than the inspections here reported.

Communications were sent to all the state boards of health making inquiry as to whether there existed any vaccine farms within their respective states and also what producers of virus were supplying the trade.

Of forty-two state boards of health to whom this request for information was sent only twenty-one made reply.

Answers were received from the following states: Alabama, Arkansas, California, Colorado, Connecticut, Florida, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, Ohio, Pennsylvania, Rhode Island, Texas, Washington and West Virginia.

It was reported that there were farms producing virus in the different states, namely, Massachusetts, Pennsylvania, District of Columbia, Minnesota, Maryland and Wisconsin.

It was noted that Alabama received such supplies as were needed from the National farm at Washington. It was stated however that there had been little or no small-pox for years and that vaccination had almost lapsed.

Arkansas obtained a supply from the Lancaster farm in Pennsylvania and also from Dr. Welker's farm in Wisconsin.

Colorado derived its supply from the Lancaster farm, from the New England vaccine farm in Chelsea, Mass., and a certain small amount from a local farm in the state called the Higgins vaccine farm in Webster Grove, Missouri.

Florida receives supplies from the National.

Iowa from the Minnesota board of health vaccine establishment located at Red Wing, Minnesota.

Kentucky uses the product of the National farm.

Maine is supplied from the Red Wing farm.

Maryland has a farm of its own within the state, which is under

the control of the state board of health. A state appropriation is made for the management and support of this farm, and vaccine virus is distributed to all physicians free upon application. The health department of Baltimore makes use of the products of the National and of the New England farms.

Massachusetts has four farms within its confines, located in and about Boston, and these supplies are made use of by the physicians according to their personal preferences. The New England, however, supplies the greater proportion probably, while the other supplies are from Codman & Shurtleff, Francis Martin and E. M. Bowker who carries on the business left by Stephen Martin and who was the successor of the original Henry Martin farm.

A circular having the heading, "The Columbus Medical Laboratory," was issued by the Lancaster county farm which stated that as a result of an examination of various vaccine points found for sale in Chicago, the majority had shown the presence of greater or lesser quantities of saprophytic bacteria, and of blood cells. The only vaccine which failed to show the presence of pus bacteria, saprophytic bacteria or blood cells was that produced by the Lancaster farm, some eleven different productions having been tested. The examinations were made by the Columbus Medical Laboratory, of which Dr. Adolph Gehrman was president. From the high official position which Dr. Gehrman holds, being the official bacteriologist of the board of health of the city of Chicago, much credence must necessarily be given to the reliability of the results, by other state boards of health. This circular was issued under date of May, 1894.

In May, 1895, a circular signed by Surgeon Walter S. Reed, of the United States Army, and bacteriologist in chief of the surgeon-general's office, had occasion to examine points received from the National vaccine establishment while experimenting upon the monkey, to determine as a control whether any pathogenic organisms were present which might influence his experiments. He invariably found in all his plate cultures the presence of the pus forming bacteria, especially the *staphylococcus albus* and *aureus* together with various saprophytic organisms, the hay bacillus being the most prominent. His attention was called to the circular issued from the Lancaster farm and desirous of obtaining a pure virus for his experiments he obtained points issued not only by the Lancaster farm but also from five other producers.

In making his cultures he obtained the whole charge which was upon the point by rubbing off into liquid agar and plating the liquid media. The method pursued by the Columbus laboratory was to wipe the points across the surface of solidified agar. It is evident that the former method is preferable by obtaining all there may be of the virus and contaminations held in the charge, and the facility

of counting the number of colonies is increased by their distribution throughout the plate rather than being bunched together and upon one another as would be the case in the streak culture.

The results as found by Surgeon Reed were as follows, giving the number of bacteria per point:

	Maximum.	Minimum.	Average.
National vaccine establishment, .....	1,380	43	383
Lancaster vaccine farms, .....	12,312	110	2,386
Chambersburg vaccine company, .....	39,440	3,300	14,122
H. A. Martin & Son, .....	17,160	4,200	9,740
New England vaccine company, .....	89,000	54,000	73,300
Minnesota vaccine station, .....	7,580	1,500	4,550

He closes his remarks upon his report as follows:

"You thus are able to conclude that there is no ground whatever for the claim made by any vaccine establishment that the virus supplied by it is free from bacteria. And it is almost superfluous for me to call your attention to the fact that, with the present methods used in procuring the virus, this exclusion of bacteria is absolutely impossible."

Your committee would call attention to this conflict of reports. In one place one farm is at the head and in another a different farm. Under these conditions it is evident that to obtain the exact condition of the points, and the amount of extraneous matter allied with the lymph and to be found upon the point it is necessary that this work must be done by parties having no interest whatever in any particular supply. The committee does not by this statement mean to infer that these experiments in either case were made with the original intent of proving that these particular farms were more favorably considered in the laboratory. There may have been other tests made in other laboratories but probably from the unsatisfactory results the findings have not been made public.

It is evident from an inspection of these farms, that the idea of asepsis is the fundamental principle, yet it is probably difficult to obtain this in bacteriological perfection from the nature of the means of propagation, that is, in animals; and so also from the fact that it is impossible to make use of germicides to assist in aseptic precautions for fear of destroying the organism or growth which propagates the disease known as variola.

While it is much easier to criticise than perform yet for the advantage of the producer as well as the consumer, who has to take the immediate recoil from an unsuccessful vaccination, it would seem desirable to observe, wherein all the methods which have been presented by those having the actual work in charge are preferable one to the other.

With this in view your committee begs leave to present the fol-

lowing rules of guidance which are not considered conclusive, nor free from comment, and what are presented, not for adoption by the conference, but for discussion and to lay the foundation for methods which can be recommended and which when used by any given farm will assure, to those using the virus, the best results obtainable.

#### Rules Pertaining to the Propagation of Vaccine Virus.

1. In the propagation of vaccine virus only young, healthy calves from four to ten weeks old shall be used.

2. The stable in which such calves are housed must be kept absolutely clean and wholesome at all times, and it must be a separate building from where other animals are housed. The walls and ceilings must be of matched boards and frequently whitewashed or painted; the floors must be solid and water tight and kept clean. The woodwork of the stanchions shall be so arranged as to be removed for cleansing purposes, and there shall also be a satisfactory arrangement for drainage. The floors must be well covered with clean straw bedding, saw dust, or some other absorbing substance and be kept dry at all times.

3. The calves so used shall be properly fed and washed thoroughly if necessary in such manner as to render them practically aseptic.

4. The operating room shall be at all time aseptic; floors, walls, and ceilings must be matched hard pine or other hard wood and oiled. They shall also be washed in bi-chloride of mercury solution from time to time.

5. The operators shall, before operating, render their hands and instruments aseptic, and put on a clean garment covering their other clothing, which garment must be washed and boiled before each time of using the same; they shall also wear a cap of like material and treat it in the same manner, or disinfect the head and hair thoroughly.

6. All operations and the care of virus after taking, shall be under the supervision of a competent bacteriologist, and no virus shall be taken from any calf until it has passed his inspection.

7. The calves so used shall be carefully washed and made aseptic before inoculation; the inoculation should be on the side preferably; never on the buttock or under the belly.

8. The virus shall only be taken in the true vesicular stage, and only warm sterilized water shall be used to wash the calves before the virus is taken. No scabs should be permitted to form on the vesicles supplying virus and the virus must not be taken after the vesicle has reached the pustular stage.

9. Virus should be taken on sterilized ivory points, or collected

in sterilized glass tubes mixed with a small amount of pure glycerine and sealed.

10. Points should be carefully dried in a sterilized receptacle and put up in sterilized paper, or sterilized metallic tubes or bottles and sealed.

11. Every package of virus must have on it the name of the propagator and the date when the virus was taken.

12. No vaccine virus will be approved by the State Board of Health of ..... unless propagated in accordance with the provisions of the aforesaid rules.

The report was fully discussed and a committee was appointed to formulate a resolution in regard to vaccination.

**"The question proposed by the State Board of Health of Kentucky:**

**"What substantial progress is being made in sanitary work in the several states and provinces?" and which was designed to bring out a statement from all boards as to the exact state of affairs in their respective jurisdiction,"** was replied to by the several representatives as follows:

**Alabama:**

**Dr. Cochran:** Mr. President and gentlemen, I have nothing especial to report for the State of Alabama. We are moving on in our old slow way, and there is nothing new or surprising that I can lay before you.

**California:**

**Dr. Ruggles:** It will take me but a few moments to tell all about California. In the first place the State Board of Health of California is endeavoring and studying how to create as many local boards of health throughout the state as possible and to establish an intimacy between those boards and the State Board of Health as an advisory board, and so work harmoniously together. There is one point in which we possibly are a little lame. That is the vaccinating business. Our laws are very weak on this point and cannot be enforced without some legislation, and I have suggested that where the local board or authorities of different sections decline or refuse to carry out the enforcement of the vaccination law the state shall withhold their proportion of the district school tax. That proposition will be laid before the next Legislature and we hope thereby to get the vaccination question in such a condition that our children will not suffer. We have not had a case of small-pox for eight years. That is what has caused the lethargy on that subject, I suppose. Perhaps it would be well for us to import some cases of small-pox which would probably serve to wake them up to the danger and cause the Legislature to make a move.

Two points especially have interested us the last year or more. One is, the establishing throughout the state a better knowledge of consumption, its cause and prevention, and how to remedy it. The state at some little expense, not much to be sure, has printed an article on that subject to be spread all over the state. We did it through the local boards of the state. The local board of health with which I was connected sent out a thousand copies and directed them to the heads of the families, not distributing them promiscuously, but aiming to reach those whom we thought would be benefited by them. I feel very much gratified and repaid for the trouble by seeing the frequent efforts being made to profit by them, and I really believe much good has been done by that consumption document.

Another point in which much interest has been taken by us during the last year is the antitoxin treatment of diphtheria. We had a very heavy epidemic of that dreaded disease in my state some three years ago. We had about thirty per cent. of deaths in my town, and ten or twelve operations of tracheotomy and lost every one of them, and we thought best to do something to mitigate the severity of it. I had listened to the lecture of Dr. Kinyoun in Washington on antitoxin as used in Europe. I went back to California imbued with the idea of the necessity of something of that kind with us. I brought the matter to the attention of our Governor, Governor Budd, with whom I am intimately acquainted, and he was very active in the matter and advised me what to do, and I went before the Legislature and in a very short time had an appropriation of \$6,000 to be expended by the State Board of Health for the purchase of antitoxin for diphtheria. I went to the veterinary department and we figured on the cost of it and found before we got a single drop of it, it would cost us about \$5,590 for appliances, etc., and we concluded we had better purchase our supply. Fortunately we have not had very much diphtheria in the state. At Los Angeles and in the southern part of the state we have had the most of it. Dr. Davis made a report that the results of the use of antitoxin have been very good, and we feel that the \$6,000 has been very well expended.

#### Colorado:

Dr. Sewell: The youngest State Board of Health in the country sends greeting to this conference. I come fresh from the first sanitary convention ever held in Colorado. The experience of the older boards shows that this is the unequaled way of coming before the people. We find many things to be corrected and revised in our community. Colorado suffers, as you have all suffered in your communities, from the lack of appreciation on the part of the local

boards and authorities of the nature of the work to be carried out. For the five years of our existence we have been struggling for a legal status, and within the last three or four months an opinion has been rendered by the Supreme Court which establishes the State Board of Health as part of the state government, and puts it among the institutions as determined by statute.

Colorado, as you know, has been considered sanitary, and particularly so for consumptives. Several years ago a large number of consumptive cases were reported as contracted in our state. I investigated the matter and found that many outside cases were registered as cases contracted in Colorado, and therefore stated these facts to the people that Colorado should not pass through the deplorable condition of becoming a hotbed for the breeding of this disease.

That work, and perhaps the general intelligence of the people through their own awakening, has started a movement in that direction which will be of vast benefit.

I think it is well to put Denver in the line of the good effects of sanitary measures. Six years ago the death rate was 23.71 per cent. per annum. Now, with a population of 145,000, the death rate is something over eleven per 1,000 per annum. Under the introduction and efficient administration of the antitoxin method of treatment of diphtheria, for the first time in the history of Denver, since diphtheria made its appearance in Colorado, the city has been quite free, not only from deaths from the disease, but of cases of the disease itself, and for at least one month. Deaths from diphtheria had numbered from fifty to seventy-two per annum from that disease alone. For the month preceding a month ago there was not a case of diphtheria in the city. We have been able as a State Board of Health to assist local boards of health in a number of respects, and we have been able for the most part by moral suasion to accomplish the desired ends.

One of the means which we have used with considerable benefit in distributing sanitary information is through the schools. A little while ago the Superintendent of Public Instruction distributed 1,500 pamphlets, and as soon as I return home I expect to have reports published which shall be put in the hands of every one of the thousand of school teachers in the state, and I am confident that that is the way to get at the people with the least expenditure of means.

Connecticut:

Dr. Lindsley: The sanitary work in Connecticut will be as understood by a brief account of our mode of administration.

Our system is unique. It is unlike any other in any of the states or provinces. Except for the establishment of a State Board of



Health a few years ago, with advisory powers only, the administration of sanitary law had continued essentially the same for the previous 100 years. In 1893, by act of the Legislature, a reorganization was effected, completely revolutionizing the methods of sanitary work in the state.

The new legislation required that the judges of the superior court should appoint, for a term of four years, a health officer in each county. The person so appointed shall be an attorney-at-law. He shall have all the powers of a grand juror in each of the several towns within his county, in matters concerning prosecutions for violations of the laws concerning contagious diseases and public health, nuisances injurious to health or life, and violations of the by-laws or ordinances relating to public health and contagious diseases, and for the prevention and removal of nuisances dangerous to public health, adopted by any incorporated city or borough, or by any town, and for violation of the laws relating to the registration of vital statistics.

Under the old practice (it could not be called a system) each individual town, borough and city was an entity, a separate, distinct, isolated and independent authority, in matters pertaining to the public health. The sanitary regulations promulgated by the different towns were often dissimilar and more often wholly wanting. There was little or no responsibility felt by the so-called health authorities.

They were for the most part elected for quite different duties, and were apt to regard their functions as health officials as of secondary importance.

There was little or no systematic effort to promote the public health, and except when a case of small-pox occurred, or in the presence of an unusually severe epidemic, did the town selectmen who constituted the board of health feel it a duty to take any action relating to public hygiene. Indeed, up to a very recent period, inaction was the predominant characteristic of town health boards, rather than action in Connecticut.

There was really no head to the sanitary administration of the state. It was practically chaotic, without authoritative leadership. The relation of the State Board to the local boards was so ill-defined and intangible, that its function in practice was mostly that of a mere exhorter to good works, a schoolmaster without authority to preserve order in the school, or command attention.

In this capacity it has labored diligently, and not altogether unprofitably. Some of the seed sown has fallen into good ground and brought forth fruit; but in Connecticut there are not only literally, but metaphorically, many stony places where the seed could not take much root, or having sprung up, has been choked by the thorns

of prejudice and ignorance. Yet it may be fairly claimed that the work of instruction by the State Board since its organization, has not only been productive of good results, but has been a proper and fitting preparation for the more advanced legislation of 1893.

While the duties of the aforesaid county health officer, as laid down in the statute, relate chiefly to legal proceedings, yet he is required to co-operate with and supervise the workings of the local health officers, each in his own county.

In the discharge of this line of duty, the town health officers have been convened from time to time at the call of the county officer, in each of the counties of the state. These meetings have been held for the purpose of instruction; for discussion of practical sanitary questions relating to their duties; for the mutual understanding of and agreement upon well considered methods of procedure in the performance of their various official functions, and to establish as far as practicable uniformity of practice throughout the state in the administration of sanitary law. At most of these meetings, if not at all of them, some member of the State Board has been present by invitation, and participated in the deliberations. These county gatherings have been exceedingly useful in a number of ways. They have been the means of a good deal of valuable information, which could not have been so well and readily communicated in any other manner. The local officers had many questions as to the extent of their legal powers officially, which have been satisfactorily explained by their county officers. The meetings might be called experience meetings, because each one could relate his own troubles and also hear of the embarrassments and difficulties of his colleagues, and by mutual suggestions each might get some help. They have developed an interest in the subject of preventive medicine which has never existed before, but which will be of the better quality because it is founded upon a solid scientific and legal basis.

The operation of this law will be of far-reaching value to the state. The effect of this most excellent and judicious method of co-operating with and supervising the workings of the local health officials, by the county officers, has been exceedingly satisfactory. One of the best results has been organization. Through the agency of these meetings the entangled, disjointed and discordant powers that were, have been brought quietly and easily together, to form an effective, united and harmonious whole. Out of chaos and confusion have resulted, in a very large measure, order and system and concerted action. The effect will not be disappointing.

It must not be forgotten that in still another direction the new laws have accomplished very valuable results. It makes it the duty of the county health officers to prosecute for violation of the laws re-

lating to the registration of vital statistics. In this direction the county officers have worked a revolution. It was most urgently needed. For many years previous to the establishment of the State Board of Health, the registration of vital statistics had been conducted in the most slovenly and disreputable manner in a large number of towns in the state. Registrars, physicians, clergymen and midwives have been almost equally guilty of violation of the registration laws.

It has been the constant effort of the State Board of Health to secure a better observance of them, and the effort has been rewarded with partial success. But as the board had no more potent influence to exert than moral suasion, its appeals usually received no more attention from the preachers than from the practitioners, while the conduct of the registrars was generally controlled by its effects upon votes.

Under present laws the county officers have begun a system of inspections and prompt notification of offenders, who are made to understand that registration is so serious a matter, that neglect of their duties relating to it will be attended with a penalty. Under the old regime there was little or no responsibility for neglect of the laws. There was no one in authority to compel their observance.

Since the county officers have undertaken the supervision of the execution of the registration laws, the State Board is much strengthened in its conviction that there are more powerful and effective influences than moral suasion, even upon those who teach the highest morality.

Still another public benefit comes from the new system of sanitary law. Its operation has been to lift the practice of public hygiene, in a large measure, out of the mire of politics.

Politics and health administration have no more affinity for each other than oil and water. The longer tenure of office under the new regulations, its independence of the popular vote, and the consequent recognition of valuable service rendered, gives a dignity, an importance and a responsibility to the position that it never before enjoyed. In this light also, the new laws promise a fuller and better fruition in the future.

It should be mentioned in this connection that the county officer shall appoint in each town in his county some discreet person, learned in medical and sanitary science, to be health officer for said town. And his term of office shall be four years, although he may be removed by the county officer at any time. This relation of the county to the town health officer, ensures an influence over the official work of the latter not easily attainable in any other way.

The county officers hold monthly meetings to deliberate upon the questions that concern their official functions. A code of regula-

tions for the sanitary government of towns has been agreed upon and adopted in all the towns in the state, thus making the sanitary administration of the state practically uniform throughout its limits. Under these regulations prompt reports of outbreaks of contagious diseases, are made to local health officers, and due attention is given them without delay. Regular monthly reports are made to the State Board by all the local health officers, of which an "abstract" is made and published for distribution to the people, on the 15th of every month, in a form of a "bulletin." In this way the State Board is kept in touch with the health officials and their work, in every part of the state. Annual reports are also made by both the county and town health officers to the State Board.

This system was not a mere occurrence, an event that took place in a day, as soon as the law was passed, but it has been a growth, steadily progressive as time and experience suggest improvements.

Its special merit is a legal element in the sanitary administration, so related to the health officials as to co-operate with them and enforce sanitary legislation as a specified function.

#### Illinois:

Dr. Scott: It appears that practically the same kind of work is being done and the same line of work is being pursued in all of the states, that is, where it relates to practical application of sanitary measures through associations formed by the different state officers working in co-operation with the State Board of Health. In the State of Illinois the results have been very gratifying. The reports of contagious diseases, and reports of sanitary conditions have been much more satisfactory, and it has given the board an opportunity to distribute literature on this subject and been of assistance in the work of the office.

I would here like to say a word in regard to the vaccination law referred to by Dr. Ruggles. I don't know whether your law is the same as in our state. We have been called upon very little this year to enforce the school vaccination law. We have not had so many cases of small-pox this year. What I wish to say is that in our state the law has been carried to the appellate court and a decision rendered by that body adverse to the state. The ground taken by the court being that such a regulation could only be enforced where small-pox actually threatened, but where such was not the case, the law compelling children in public schools to be vaccinated could not be enforced, and that decision stands against us now.

The most important work of the board of health has been instrumental in securing is a work that was begun largely through the influence of Dr. Rauch, and that is a systematic analysis of the waters

in the state. This work was undertaken by Dr. Rauch in 1890, and it was done without any regular appropriation whatever, the money being only just what he could squeeze out of the general appropriation, and when we are done with routine work there is not much left to squeeze. At the last session the Legislature assisted in the work, and it was largely through the influence of our board that an appropriation was made providing for the equipment in the University of Illinois, at Champaign, of a complete laboratory for the scientific and systematic analysis of the waters of the state, and a complete analysis is now being made and record kept, as well as the local analysis of water where there is danger of disease.

Considerable investigation and work has also been stirred up by the State Board of our State in the matter of the inspection of animals used by the various state institutions, to ascertain the presence of tuberculosis. The State Board of Live Stock Commissioners conduct this work, and the results have been surprising indeed, some herds showing as high as forty-five per cent. responding to the tuberculin test. At Elgin there was forty-five per cent., and at Kankakee almost as much. The remarkable thing about it is that in every instance where the tuberculin test has shown the presence of tuberculosis the post-mortem examination has verified the test. There was not a single instance where this was not true. The cattle were all killed, and the State Board of Public Charities is now considering the advisability of having every animal that is to be used by the state institutions tested, and if it does not stand the test before purchase the animal shall simply not be bought at all.

A part of the work and one that I want to bring especially to the attention of the conference, is a proposed amendment of the school law of this state requiring that every applicant for a teacher's certificate shall qualify physically as well as mentally; for instance, to show that there is no hereditary tendency to tuberculosis. I have known instances where there were teachers directly affected with tuberculosis, and there was promiscuous kissing of favorite children in their school practiced. All of the schools of the state should be placed under strict medical supervision. A committee of the local board of health should be authorized to go to the school house about once a week and make a personal examination of every child, and whenever they find any symptoms of the presence of a contagious or communicable disease they should have authority to exclude that child from the school until such a time as it shall present a certificate from a reputable physician stating that it is in such condition that it may return. Such a question has been before the Legislature of our state and the State Board of Public Instruction had representatives before the committee to whom the matter was referred. I have received a great many letters on the subject, and another effort

will be made in that direction next winter. You will understand I am simply talking for the State of Illinois. I am not encroaching upon the state of Chicago. The health commissioner of the state of Chicago is here and should not be overlooked.

Dr. Ruggles: I wish to add a remark in regard to the State of California. Under the auspices of the State Board of Health of our state we have held each year a sanitary convention. Every physician in the state has been notified of the date of this meeting, every local board of health has been invited to send delegates, and persons of well known celebrity have been requested to participate in furnishing papers on various sanitary subjects, and we have been very successful in that line. I presume one of the principle reasons for our success is that the State Board of Health pays expenses.

Another point the gentleman from Illinois' remarks suggested to me; at the last sanitary convention held in Los Angeles, which was in last April, it was very seriously contended that medical men who emigrated to California, suffering with tuberculosis, should not be allowed to practice medicine in that state, or rather certificates shall not be issued to them permitting them to practice.

Indiana:

Dr. Hurty: I can say for Indiana that the progress we are making is not very great at the present time, unless it is that the new law that we have in view might be called our progress. The law under which our board was created was passed in 1881; in 1891 it was reviewed and changed, but not much for the better. It is a very poor excuse for a law, as it is entirely inadequate and not at all up to the times. Our board has met in session and formally and regularly passed a resolution asking the Legislature to abolish it as it now stands, and abolish the law that has created it, but at the same time requesting that it pass this new law, that is, the law we are now studying on.

Some little work has been done. Some circulars have been sent out. We have passed a new set of rules for this fiscal year ending November 1. We have passed dairy rules and printed circulars and sent them to all parts of the state, and we have sent out some health circulars. These have attracted some attention, and interest has been aroused to some extent in health matters and has brought forth some criticism; which is a good thing, as it serves to call attention of the public to these matters of public health. Health circular No. 1 was called "The Dust Pollution Circular." One of the provisions is that grocers and other purveyors of food should not expose their goods to dust. Our circular has caused butchers to cover their meat in wagons. Where formerly we used to see meat going through the streets in wagons with all kinds of dressed carcasses exposed to the dust and dirt, that has been practically done away with.

There has been another movement inaugurated lately in our midst which promises well. That is in regard to the spitting nuisance. A letter was sent first to all railroad superintendents setting forth the desirability of stopping the spitting nuisance in cars. We met with an immediate response from forty-seven of the fifty-three railroad superintendents in our state, and I presume that every one of them will answer in the end, and every one approved of the movement to take some step to stop the nuisance.

We have also been doing some work in the diphtheria matter. The State Board of Health now furnishes culture serum on application, but of course in the proper manner, being sent to the county officer when he writes for it. So far, since March 12, when I went on the board, we have examined and reported on some 123 cases. This shows that the physicians are interested in this work. Of course we have pursued the regular method of attending to the diphtheria cases, but this treatment was new with this board. We are also preparing to make careful analysis of all typhoid cases. The circular we issue is a circular of instructions to the county officers, and directs them that when a case of typhoid is brought to their notice they should proceed to that place and make the proper sanitary survey; they should apply the proper questions and the report the answers and send in samples of water. Of course the circular tells them how to collect the water. These sanitary surveys are coming in pretty well, and it is indeed very encouraging to see the interest that county officers are taking in the question of causes of typhoid. Water has been sent in to a great degree. Indeed, it is getting to be more than mere private enterprise can handle. That constitutes our situation in Indiana, and I hope that in another year we shall have a more creditable showing to report.

President: Gentlemen, before we continue in this discussion, I wish to call your attention to the fact that we have a long program, and unless we shorten our remarks, we shall not be able to get through with it.

Dr. Swarts: As each of the gentlemen who have spoken have taken at least ten minutes, and there are still about ten to speak, I move you, sir, that the remarks be limited to five minutes for each person.

This motion prevailed.

Maryland:

Dr. Stuart: I will only take up a few moments of your valuable time. Maryland has been working very much on the same lines as stated by the gentleman from California and others, in regard to the progress made by their individual State boards of health. We have a law which creates local boards of health, or rather

officers. The county commissioners of every county are ex-officio boards of health, and they appoint health officers. They hold a meeting twice a year, and must also make reports to the State Board of Health. I have ever since I have been connected with the State Board of Health, made it my practice to visit every county in the state. I announce my intention beforehand and invite all the physicians in that neighborhood to be present. Many individual citizens also attend these meetings, and this gathering is practically a sanitary conference in each county on every occasion of my visit. In pursuing that idea I have been very successful indeed, and I have had a very interesting meeting at the county seat of every county in the state, and have disseminated a great deal of sanitary information, which has borne very good fruit. But there is another feature; I am now seeking to establish a sanitary improvement association in every village and hamlet in the state, and particularly endeavoring to interest the women in it, and make them members of this sanitary improvement association as we call it. That has been very successfully carried out so far, and they have taken hold with a great deal of enthusiasm. The principal thing they seem to want is information on the various subjects. They come forward, especially teachers, and ask the State Board of Health to give them all the documents we have in regard to sanitary measures, and say, "We want them in order to teach the people with whom we are surrounded." I will only go on to say that the law of the State Board of Health of Maryland in regard to vaccination has been exceedingly well carried out in our state. We had a few months ago, twenty-seven cases of small-pox and seven deaths in St. Charles county. With that exception we have had none, and I think the state is very well protected. Particularly with the plan I have adopted of sending circulars and copy of the laws to the public school teachers. Every teacher in the state of Maryland has received a circular, wherein vaccination is made compulsory, and stating to them their duty and other directions as stated by the law. That is all I have to report.

#### Michigan:

Dr. Baker: There has been considerable progress in Michigan during the last year, in connection with sanitary work. Some valuable and interesting new work has been inaugurated, which has thus far proved exceedingly satisfactory. One of the most important lines of new work is that in connection with the distribution of educational leaflets to teachers, etc. The Legislature of Michigan for 1895, enacted a law (act 146) which requires that there shall be taught in every year in every public school in Michigan, the principal modes by which each of the dangerous communicable diseases is



spread, and the best methods for the restriction and prevention of each such disease. The law also makes it the duty of the Michigan State Board of Health to annually send to the public school superintendents and teachers throughout the state, printed data and statements which shall enable them to comply with this act.

In order to comply with this state law, the State Board of Health prepared a concise statement of just how each of the dangerous communicable diseases is spread and the best methods for the restriction and prevention of each of these diseases. This concise statement was printed in the form of a four-page leaflet (No. 226). A two-page leaflet circular (No. 227) of instructions was also planned to accompany the "data and statements" to school commissioners, school boards, superintendents and teachers throughout Michigan.

Hon. Henry R. Pattengill, Superintendent of Public Instruction, agreed that he and his office would do all in their power to help to enforce the law, and as soon as the State Board completed the "data and statements," copies of the document were distributed at teachers' institutes to all teachers in attendance, and a sufficient number left with the county school commissioner, that he might supply a copy to each teacher in his county, not in attendance at the institute. The Superintendent of Public Instruction and his office have courteously aided the State Board of Health in every way practicable to carry out the provisions of the act. To effect a more complete distribution among the teachers, the co-operation of the county school commissioners and city superintendents was asked and received, and the hearty support which the State Board of Health has received from these school officers, and the many letters from teachers, demonstrates that the law finds a popular and cordial support among the teachers, school officers and educators throughout Michigan.

It is remarkable as well as gratifying to see the practical working of the law. The information can be imparted to even the smallest pupil, and it is surprising to see how some very small children gain the information, and have definite ideas of the ways the diseases are spread and just what should be done for the restriction of such diseases.

For each of the several different dangerous communicable diseases the Michigan State Board of Health publishes and distributes a larger leaflet or pamphlet containing more complete information regarding the restriction and prevention of each disease, than is supplied by the one prepared for teachers. A copy of each of these leaflets was arranged into a set, and bound on the edge by means of a stapling machine for a convenient form for use of the teachers. There are about 16,000 teachers in Michigan. During the year ending June 10, over 20,000 of these sets were distributed to teachers,

school officers and others interested in the educational work in Michigan. In addition to these sets many hundreds of the two leaflets (Nos. 226 and 227) were distributed separately.

The Michigan Legislature of 1895 enacted another important law (act 45) which requires that before a body dead from a dangerous communicable disease can enter a locality in Michigan a permit must be obtained from the board of health or the health officer, and then the entrance must be under the supervision of the health officer of said township, city or village. Violation of this law is deemed a misdemeanor punishable by a fine of not more than one hundred dollars, or by imprisonment in the county jail not exceeding three months, or both said fine and imprisonment.

In explanation of this law the office of the State Board of Health issued a circular (No. 229) of memoranda for the guidance of railroad officials, health officers, physicians and others "relative to what are communicable diseases dangerous to the public health." This circular gives a list of the diseases which are dangerous to the public health, and the synonyms or names by which the different dangerous diseases are sometimes called.

In order to protect themselves and for instructions to their local station agents, the railroad companies doing business in Michigan framed and published rules with special reference to this act. (45, laws of 1895.)

Following its usual custom, to take up, from time to time, the restriction of some disease, the Michigan Board has framed and published a six page leaflet (No. 229) on the "Restriction and Prevention of Whooping-Cough." An edition of 10,000 copies was printed in February, 1896, and has since been widely distributed, especially to the local health officers of townships, cities and villages from which whooping-cough has been reported. The health officer is instructed to distribute the copies of this leaflet to the neighbors of the family in which whooping-cough exists.

This pamphlet on whooping-cough, in addition to the recommendations for its restriction and prevention, gives information relative to the period of incubation, modes of spreading, duties of the health officers and of the local board of health, disinfection of rooms, clothing, etc., age at which most deaths occur, importance of its restriction; and on the last page is a diagram showing the relative importance of the disease, comparing the number of deaths from whooping-cough with the number of deaths from consumption, diphtheria, scarlet fever, etc., and especially with small-pox.

The leaflet (No. 176) on the "Restriction and Prevention of Measles" has been revised. The revised edition was printed (sixth edition) in March, 1896, to the number of 20,000 copies. This revised edition contains information relative to the period of incubation, modes of

communication, placarding, reports by householders and physicians, duties of the health officer and of the local board of health, disinfection of rooms, clothing, etc., how to avoid and prevent, importance of restricting the disease; and on the last page is a diagrammatic chart showing the relative importance of measles compared with deaths from other dangerous diseases.

The work for the restriction of scarlet fever, diphtheria, small-pox and typhoid fever has been continued.

Since consumption was placed on the list of diseases dangerous to the public health, the Michigan State Board of Health has made vigorous efforts for its restriction. Prior to that time an educational campaign had been in force for several years, but the legal control of the disease was not undertaken until September, 1893. A leaflet on its restriction and prevention had been in use for several years, but up to the time its legal control was undertaken, no systematic distribution of the leaflets of information could well be practiced.

When the disease was placed on the list of dangerous diseases, immediate steps were taken to instruct local health officers and people generally that reports to the local health officer by physicians and householders would be expected, and local health officers were instructed to report cases to the central office. When notice of a case was received a package of ten of the leaflets on this subject was sent to the health officer, who was instructed to hand one to the patient and to friends and neighbors of the patient sick. The pamphlet gives information just how the disease is to be restricted, the principal precaution being the disinfection or destruction of the sputa. If the patient takes the proper precautions and complies with the recommendations of the State Board contained in its leaflet (No. 175) on the restriction and prevention of consumption, the board does not recommend isolation of the patient from the public; but, if the patient is wilful, careless, or insane, it is recommended that isolation of the patient be considered.

When a report of a new case is made to the State Board by a health officer, a circular ("blue-letter") especially planned for this disease is sent together with the leaflets mentioned above. This "blue-letter" contains special instructions to the health officer concerning his duties, and concerning reports to the office of the State Board, so long as the disease lasts.

The health officer is required to make weekly reports on blanks and in accordance with instructions from the central office.

When the patient recovers or dies, the health officer is required to make a special final report on a blank especially planned and relating to consumption.

These different reports from all sources are compiled, and the information is woven into an article on the subject for the annual re-

port of the board. The report of this board for 1895 will contain a compilation relative to consumption in Michigan in 1894, the year 1894 being the first full year in which the legal control of consumption had been undertaken.

**Dr. Ruggles:** Gentlemen, I have the honor to announce to you that there is present, Mr. Reddick, of the sanitary board of Chicago, who wishes to make an announcement to you which I have no hesitancy in saying will be an agreeable one.

**Mr. Reddick:** I will ask your indulgence for a moment while I read an invitation from the sanitary board to make a trip for the purpose of conducting the gentlemen of this conference on an inspection of the drainage canal.

The invitation is as follows:

"You are invited to attend the tour and inspection of the main channel of the sanitary district of Chicago, Thursday, June 11, 1896, tendered the International Conference of the State Boards of Health by the board of trustees of the sanitary district of Chicago.

"B. A. ECKHART, President.

"JAS. REDDICK, Clerk.

"Luncheon will be served at Willow Springs at 1:30 P. M.

"Special train over A., T. & S. F. R. R. leaves Dearborn Station, Dearborn and Polk streets, Chicago, at 12 M.

"Please present this card at the gate."

I think this trip will be interesting to the delegates to this convention. We will make one or two stops between here and Willow Springs, where luncheon will be served, and we will then proceed on down the channel to Lockport, where the delegates will be conducted to the highest point and where they can get a fine view of the rock cut. We believe you will enjoy the trip, and desire as many as possible of the delegates to go. I have some invitations here which I will leave with the secretary, and which I trust you will make use of.

**Dr. Baker:** I move that the invitation be accepted with thanks.

The motion prevailed.

#### New Jersey:

**Dr. Mitchell:** Mr. President and gentlemen, I will condense what I have to offer into five minutes' time, probably within four, and then would like one minute to follow Pennsylvania. The outline of our work is as follows:

**First.** Our work is to assist all local boards in the conduct of sanitary measures.

**Second.** The investigation and remedy of epidemic outbreaks throughout the state and action in cases of emergency. By the word "emergencies" I do not intend to include outbreaks of epidemic diseases, but rather unusual occurrences which come up in the work

of local boards. Epidemic outbreaks are especially to be placed in the care of the State Board of Health for the reason that no sanitary district can be depended on to protect its neighbors. We act promptly in these matters, bearing this point in view. In all such cases we immediately notify all surrounding districts. We go on the ground and see what can be done.

In regard to communicable diseases. A law was passed in 1885 providing that every physician should report every case of a communicable disease to the local health officer and should make a report of the condition of the patient every week or so. That information, when it reaches us, we use in notifying adjacent sanitary districts and send an inspector to the locality when the number of cases seems to assume a dangerous form.

Third. The inspection of state institutions. This is made our duty under the law. This is in regard to water and all facts that relate to sanitary control. These facts are reported to the board. If, after an inspection, we decide certain things need remedying, we notify the parties in control, and if it is not remedied notify them again. I will say we generally succeed in securing their attention.

Fourth. Inspection of ports. In our state we have a number of small ports. It is our duty to see that they have every possible provision for the proper handling of immigrants who may come in suffering from any contagious disease.

Fifth. Inspection of towns. This we are doing systematically and carefully. We inspect towns, each town, if possible, once a year, for the purpose of gathering all facts with reference to their drainage water supply, condition of parks, street paving, etc., and all matters which are included in the general term of public works.

This includes the inspection of resort hotels. Our state, as you know, has a great extent of sea coast which is very much resorted to during the summer season by people from the large cities, and we have found upon an examination of many of the resort hotels which have grown up suddenly at these various resorts that they are built without very much regard for anything except making money. I am glad to say that we are making progress in bringing that class of places into better sanitary condition.

Sixth. Inspection of dairies. This is new work for us, and we have only been at it for about a year. Dairies are being inspected as fast as our limited number of inspectors will permit. The reports of the result of these inspections are sent to the consumers. We send them to places where the milk is sold. It makes no difference whether it is sold in our state or in others. We examine the dairies as to the condition of the animals and the milk, the way the premises are kept, the habits of the people on the

premises, and also as to the washing of the cans. We have laboratories for the free examination of specimens—

President: Doctor, your time is up.

Iowa—

Dr. Guilbert: The State Board of Health, created by an act of the 19th General Assembly in 1880, as the result of a vigorous and persistent effort of the legislative committees of the Iowa State Medical Society, and the Iowa Hahnemann Medical Association, led by the chairman of their respective committees, to wit: Drs. W. S. Robertson, of Muscatine, and E. A. Guilbert, of Dubuque. The campaign was against odds, and was signalized by a general petition endeavor, and by several conferences between the joint committees of the Senate and House, and those of the two state medical societies aforesaid. The majority for the law "was neither as wide as a barn door, nor as deep as a well," but it was sufficient to triumphantly launch the new board on the sea of affairs, and give it free course.

Dr. Robertson was one of the initial members of the board, and was its first president, filling that office until his lamented death, January 20, 1887.

The first secretary was L. F. Andrews, who held the place one year. He was succeeded by Dr. R. J. Farquharson, of Muscatine, who held the office until his death, September 6, 1884, when he was succeeded by Mr. Andrews, as acting secretary until May, 1885, when Dr. J. F. Kennedy, of Des Moines, was elected secretary, and has been annually re-elected since, and has achieved wide distinction in this position. Mr. Andrews has, since 1885, been retained as assistant secretary, despite his infirmity of hearing; his scholarly attainment and his clerical ability, making him an indispensable factor of the secretary's staff.

By this legislative act the board was given general supervision of the interests of the health and lives of the citizens of the State, and have charge of all matters pertaining to quarantine; supervise a state registration of marriages, births and deaths, and make such rules and regulations as were deemed necessary for the improvement and preservation of the public health.

The board originally consisted of seven physicians and a civil engineer, whose term of office is seven years. The governor in selecting the membership of the board wisely apportioned it among the different schools of medicine, and that rule has since been followed.

The first meeting was held May 5, 1880, at which an organization was perfected, and plan of operation proposed. As the project was deemed largely experimental, it was decided to proceed by educational methods, and by suggestions to so mould popular opinion, and

instruct the masses in the elements of sanitary science, that they would see and accept the operations of the board as a philanthropic movement to secure to them better food, water, ventilation, homes, longer life, and economy in expenditure for sickness and disease, rather than to establish and enforce coercive measures. Circulars were prepared upon contagious diseases, water supplies and contagious diseases among domestic animals for general distribution.

Among the rules early adopted was the prohibition of the transportation of persons dead from smallpox, Asiatic cholera or yellow fever. In 1890, diphtheria, membranous croup and leprosy were added to the inhibited list, and a permit from the State board for the disinterment of a corpse in all cases was required. It was also ordered that no permit should be given for the disinterment of bodies inhibited from transportation. This rule has been adopted by the National General Railroad Baggage Agents' Association, and is in force on all railroads in this state.

In 1893 the board began to take more advanced position in the exercise of its powers, and its regulations were made mandatory rather than directory, the public mind having become more appreciative and receptive.

In 1892, when cholera so forcibly menaced this country, the board met in September to consider the subject. Regulations were prepared, quarantine stations established throughout the state on all railroad lines, rigid means of inspection provided, and all necessary preparation made to protect the people against an invasion.

Smallpox has several times invaded the state by immigration of foreigners and tramps, but it has seldom spread beyond the family in which it originally appeared, so efficient are the measures provided for its extermination.

In 1894 a veterinary department of the government was created, and a state veterinary surgeon provided for who was given general supervision of all contagious and infectious diseases of domestic animals. He was added to the membership of the state board of health, and with the board empowered to make regulations for the prevention and spread of such diseases. As an auxiliary to the board the department has been a notable benefactor.

Early in the history of the board it was found that a serious loss of life and property was caused by the sale and use of dangerous kerosene oil. Through persistent effort of the board, in 1884, an act of the Legislature was secured regulating the sale and use of all products of petroleum for illuminating purposes, and the standard of oil to be used was fixed at 100 degrees Fahrenheit. In 1886, to secure still greater protection, the standard was raised to 105 degrees. Under this statute the state board is given general supervision of the oil inspection service, with authority to make regulations governing the

spectors. Since the inauguration of this protective measure, the loss of life and property has been nil.

In 1893 the board began an educational system to get rid of consumption and tuberculosis. Both were declared contagious, infectious and preventable. Preventive measures were adopted and commended to the people, it being deemed unwise to attempt mandatory or coercive measures. The investigation was extended to tuberculosis among cattle, especially dairy herds, and the veterinary department has since been vigorously pushing its labor toward the extermination of the disease.

The coal mining interests of the state is an important one. A serious menace to lives and health of miners was the smoke and odor of the oil used in lamps of miners. Protective measures in other states, with none in this, made Iowa the dumping ground of the most detrimental and villainous illuminating compounds. Four years ago the state board made unsuccessful effort to secure legislation in this regard. The effort was renewed at the recent session and an act secured which prohibits, under severe penalties, the use of any but pure animal and vegetable oil and paraffine wax for illuminating coal mines, and the state board of health was directed to fix the standard of such oil, and make regulations for the inspection thereof.

From chaos in 1880, with public sentiment antagonistic to all encroachment upon private interests, there has been developed a thorough and complete system of protection against preventable diseases, and universal approval thereof. In every city, town and township in the state exists a board of health whose duty it is to protect the lives and health of the people within their jurisdiction, having unlimited discretionary power, with ample authority to enforce all necessary sanitary measures, hence there can be no epidemic of a contagious disease, or the existence of a nuisance detrimental to the public health in any community except by neglect of official duty.

There is good evidence to show that the mortality rate of the state is being decreased, better methods of living adopted, and more healthful homes secured.

The board is restrained from doing all it desires from want of funds, its allowance being only five thousand dollars per annum, for all expenses, yet, with even this the board has secured an up-to-date library of latest and best authors upon sanitary and hygienic subjects, probably unsurpassed by that of any other state. It also publishes a monthly periodical, educational in character, which is sent free to every local board, and to sanitarians in the state. It distributes, generally, circulars upon the prevention of contagious disease in public schools, smallpox, typhoid fever, scarlet fever, puerperal fever, disinfection, nuisances, contagious disease among do-



mestic animals, potable water, public water supplies, school hygiene, street pavement, ventilation, disposal of household waste, resuscitation of the drowned, kerosene oil and what to buy, lamps and how to use them, danger from gasoline, and various hygienic subjects.

Particularly pointed have been the pamphlet utterances of the board, with reference to that deadly product of petroleum, known as gasoline. Especially as to its use in stoves.

The dangers thereof have been often indicated and the precautions as to its manipulation as frequently outlined. So far, however, it seems that the seed we have sown has literally fallen on stony ground, for its thousand-Herod capacity as a slaughter of the innocents—the heedless women who will not learn and the little children who are too young to comprehend or to fear—are daily being numbered among its victims. The use of gasoline for cooking purposes should be prohibited by law for it is an ever present menace to health and life. Quite as much so as are any of the poisons which righteous laws do not allow to be vended, except under stern restrictions.

This is a matter, it seems to us, most worthy the considerate attention of this conference, to the end that the state boards of health represented here, may be induced by our action authoritatively and unitedly to enter upon and energetically to prosecute a campaign for the enactment of such laws in the separate commonwealths, as will exercise the vaporous demon which now revels in “murder and sudden death.”

We can assure you that the Iowa State Board of Health will not be a laggard in this philanthropic strife.

From time to time the Iowa board has devoted earnest endeavor to secure the passage of laws inimical to food and drug adulteration. Twice, in our history, have bills to this effect been passed by one branch of our legislature, only to fail in the other. These annoying failures in the arena have not dismayed us. We have been “content to labor and to wait,” remembering the Miltonian axiom—“They also serve who only stand and wait.”

We do not despair of seeing our hopes, which sometimes have been almost misgivings, crowned with glad fruition in the not remote future. Then, when we have had conferred upon the board a wise enlargement of its legislative powers, accompanied by an adequate endowment, then will the board be enabled to carry out to their logical sequences, the benign health laws of the state. Heretofore, these multiple hindrances have put us in a category similar to that in which the Israelites “suffered and grew strong” in “the land of Egypt and the house of bondage,” that is to say: A certain tale of

bricks was by law required of the board, but it was denied the straw necessary to perfect the combination.

### Ohio—

Dr. Probst: Responding for Ohio to the proposition from Kentucky—What Substantial Progress is being made in Sanitary Work in the several states and provinces—, I would report, that 620 of the 702 cities and villages in Ohio have properly organized boards of health. Of the 1,357 townships, 1,118 now have boards of health. The efficiency of these boards, and the scope of their work is becoming greater from year to year. All are in complete harmony with, and are guided to a great extent by, the state board of health.

By the provisions of an act passed in 1893, every city, village or corporation proposing to introduce water works or a sewerage system, or to change or extend water works or sewerage now in use, must submit plans to, and receive the approval of, the state board of health. Since the passage of this act, the state board of health has been called upon to approve plans for water works or sewerage in 93 cities, villages and public institutions.

The board condemned proposed changes in sewerage in the city of Cleveland, whereby the water supply would have been still further endangered, and was instrumental in bringing about extensive sanitary improvements in that city, involving the expenditure of several millions of dollars. The intake for water is to be extended  $2\frac{1}{2}$  miles further into Lake Erie. An intercepting sewer will discharge all sewage ten miles from the new intake, and a garbage plant will prevent further dumping into the lake.

Cincinnati has voted to spend six and one-half millions for a new water supply. The intake will be from the Ohio river some miles above the city; the water will be given six days for sedimentation and then be subjected to sand filtration.

Columbus has taken steps to improve its water supply, and now has in operation the Detroit system of garbage disposal.

Dayton is building a garbage destructor.

Lorain, a lake city of 15,000, has contracted for mechanical filtration of its water supply. Elyria, a city of eight thousand, is laying a pipe eight miles, to Lake Erie, for a new water supply, and will arrange for filtration, should this be found necessary.

Postoria, a city of nine thousand, is building works for filtration of sewage; is also constructing a garbage disposal plant.

Chillicothe, the state board of health having refused permission to turn raw sewage into the Scioto river, has contracted for sewage filtration works.

The Ohio State Reformatory at Mansfield, an institution to be opened soon, is putting in sewage filtration works.

The last Legislature gave the hospital for insane at Toledo \$20,000 for purifying its sewage. The city of Toledo has arranged to purify a part of its sewage by filtration.

The city of Alliance, being prohibited from sewerage direct into the Mahoning river, has just completed a chemical precipitation plant.

There is, in fact, a great general movement in Ohio looking towards better public water supplies and improved methods of sewage and garbage disposal, which will soon bring about vastly better sanitary conditions. The state board of health has been giving this part of its work special attention, and it has been the cause largely of securing for it better appropriations than heretofore.

Two general acts of sanitary significance were made laws by the last Legislature. One regulates the practice of medicine, the other the practice and construction of plumbing. The board of health in every city or village having water works or sewerage, appoints a board of examiners before which all plumbers must come for a license to practice; and also appoints a plumbing inspector. The boards of health are required to adopt and enforce regulations governing plumbing work. The state board of health will endeavor to have these uniform throughout the state.

On the whole it may be said that the past two years has witnessed decided improvements in sanitary conditions in Ohio.

#### Pennsylvania—

Dr. Lee: The most encouraging feature in the work of sanitary reform in this state is the steady increase in the number of local boards of health, each of which not only does work, of varying efficiency, but in many cases I am glad to be able to say, of very great efficiency, for the protection of the lives and health of the citizens within its jurisdiction, but also constitutes a centre of missionary work for the surrounding rural district.

When, a little more than ten years ago, the State Board of Health took a general survey of the State in inaugurating its work, it found but fifteen boards of health in operation, these being confined to the larger cities and towns, and each working under a special charter. It is now able to report 531 boards of cities and boroughs acting under uniform general laws. A considerable number of these boards have united to form an association under the title of "The Associated Health Authorities of Pennsylvania." This association meets annually to discuss practical topics in regard to sanitary administration, compare notes and afford mutual encouragement to its members. The first meeting was held in the month of January, 1894. To this meeting 206 delegates were officially accredited and 117 boards were represented. Under this stimulus a few county associations, under the title of "The Associated Health Authorities of

County" have been formed. The State Board has adopted a resolution urging its county medical inspectors to use their efforts for the establishment of such an association in each county.

With the approval of the State Board of Health, Dr. Wm. B. Atkinson, medical inspector to the board for Philadelphia county, has begun the publication, during the present year, of a quarterly journal of sanitation, under the title of "Public Health." This journal will be the organ of the State Board of Health, of the Associated Health Authorities and of the State Quarantine Board.

As an evidence of the increasing interest in public health matters a compilation of the laws passed by the last State Legislature relating to the protection of life and health is herewith presented. The number of these laws is 28. Among them will be found acts for "establishing a State Board of Veterinary Medical Examiners, and regulating the practice of veterinary medicine and surgery," "a live stock sanitary board, to provide for the control and suppression of dangerous, contagious and infectious diseases of domestic animals," and "a State Board of Undertakers in Cities, with systematic examinations, registration and licenses." The most important measure, however, was an act entitled, "an act to provide for the more effectual protection of the public health in the several municipalities of the Commonwealth." This act is in fact a State Sanitary Code so far as the restriction of the spread of communicable diseases is concerned. It makes this branch of sanitary law uniform throughout the Commonwealth for the first time, and possesses the additional advantage of conveying the power to enforce its provisions directly to boards of health without the intervention of city or borough councils. The same merit inheres in the new laws providing for the regulation of house drainage and the registration of journeymen and master plumbers in all cities and boroughs having systems of water supply or of sewerage.

The department of our work which presents the least encouraging features, so far as legislative interest and action are concerned, is the registration of vital statistics. While in many of the larger towns registration of births, marriages and deaths and of communicable diseases is made with considerable exactness, throughout the rural districts, the only registration of births and deaths is that made by the assessors, whose report is made to the clerk of the orphan's court of each county. There is no system of State registration whatever.

Our board has inaugurated a plan for extending to all boards of health in the State the advantages of a bacteriological diagnosis in cases of diphtheria, such as is furnished to physicians in the large cities by their boards of health.

It will probably interest the members of the conference to know that the State quarantine service on the Delaware river is at the present time one simply of observation and inspection, the United States stations at the Delaware break water and at Reedy island being relied upon for the detention of vessels and suspects, the treatment of the sick and the disinfection of vessels and effects. The law, however, authorizes the Governor of the State, whenever an emergency occurs which, in his judgment, makes it necessary, to re-establish a fully equipped quarantine service.

The efficiency of the State Board of Health is still greatly hindered by lack of means, an embarrassment which it feels to a greater extent than many other boards from the fact that its executive duties, in the control of epidemics and abatement of nuisances, throughout all the rural portions of the State, are so extensive.

#### Quebec—

Dr. Lachapelle: "The sixth question on the program of the Conference being very indefinite, the board of health of the Province of Quebec will refer only to the improvements made in its laws since the New York meeting of this conference.

I. We have since 1893 a law on vital statistics which has given very satisfactory results in the collection of mortuary statistics. Of 882 municipalities, which the province includes, only thirty-three have sent incomplete returns, and twenty-five no returns to our department of statistics, during the past year.

We get the number of all marriages registered in the province.

Our birth returns are not all reliable. The law of registration, which existed long before our board was created, does not provide for compulsory registration of births, and, consequently outside of the Catholics, who are always baptized within a very few days after their birth, and male Jews, which are brought to the rabbi for circumcision soon after birth, the returns which are sent by the other religion (Protestants) are not, as their clergymen themselves testify, very reliable. The legislature has not yet seen fit to remedy this.

The following data are very reliable.

	1893.	1894.	1895.
Death rate for the whole province, . . . . .	20.28	22.72	21.24
For the year 1894: Birth rate in thirty-five counties of the province in which there are very few Protestants, . . . . .			43.62
Death rate in above thirty-five counties, . . . . .			23.26

II. Since 1894 the board has had the control of the sanitation of the industrial establishments and has formulated by-laws respecting: (a) the supply of drinking water, (b) the lighting, (c) the cubic space, (d) the airing and ventilation, (e) the cleanliness and means of

cleaning, (f) the expulsion of and manner of disposing of dust, gases, vapors and refuse produced during the work, (g) the manner of making drains, sinks, lavatories, urinals and closets, and the manner of disposing of waste water of factories, (h) the temperature of the rooms.

These by-laws are enforced under the supervision of the board of the inspectors to factories.

III. At the last session of the legislature, our laws regarding cemeteries and burials were revised, many improvements being made, for instance, (a) the sites of future cemeteries will be chosen by our board, (b) contagious corpses will not be brought in churches during funerals, (c) corpses will have to be buried or walled in, when deposited in vaults, (d) interments in churches will be tolerated only when the head of the diocese will have taken the responsibility in each case.

IV. Since 1894 our public health act has enabled the board to pass by-laws, requiring that, under penalty and risk of being demolished if necessary, all projected water-works and all projected municipal systems of sewerage will have to be approved by the board previous to their being constructed.

V. I might add that since the New York meeting, our board has established laboratories. The bacteriological department being completely organized, the chemical department being actually put in working order, so as to end the temporary arrangements made elsewhere by our chemist.

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#### AN ACT CONCERNING THE COMPILATION OF VITAL STATISTICS.

(Assented to February 27, 1893.)

Her Majesty, by and with the advice and consent of the Legislature of Quebec, enacts as follows:

1. The following paragraph is added after paragraph fourth of section first of chapter third of title seventh of the Revised Statutes.

##### § 4a. Vital Statistics.

"3059a. The Board of Health of the Province shall, every year, make the compilation of births, marriages and deaths, as well as causes of deaths by means of the information it may obtain in virtue of this law and to transmit such compilation to the Provincial Secretary on the first day of March.

"3059b. During the first fifteen days of January in every year any person entrusted with the registration of births required by the civil code shall forward to the Board of Health of the Province a return, in the form A of this law, of the births registered during the preceding year.

If the registers of several municipalities are kept by one person, such person shall use a separate form for each of such municipalities.

"3059c. Every secretary-treasurer of any municipality shall, during the month of January in every year, forward to the Board of Health of the Province a return, according to form A, of the births registered by him during the preceding year.

"3059d. During the first fifteen days of January, in every year, any person entrusted with the registration of marriages, required by the civil code, shall forward to the Board of Health of the Province a statement drawn up in the form B of this law, of the number of marriages registered by him during the preceeding year.

If the registers of several municipalities are kept by one person, such person shall use a separate form for each of such municipalities.

"3059e. Every physician who has been called upon to give professional services during the last sickness of any deceased person, shall, under his hand, certify to the death and cause of death of such person, according to form C of this law.

When no physician has been called, or when it is impossible to have a physician's certificate, this certificate is signed, either by the clergyman who has been called or by two credible persons who establish, to the best of their knowledge, the cause of death.

Such certificate shall be required by the person entrusted by the civil code with the registration of acts of civil status before proceeding to the interment or granting the burial permit.

On the first juridical day in every month, the person entrusted with the registration of acts of civil status, shall forward to the board of health of the province the certificates received by him during the preceding month.

During epidemics, the Board of Health of the Province may require that these certificates be sent oftener than once a month.

The certificates shall be destroyed immediately after the compilation of these statistics.

"3059f. The Lieutenant-Governor in council may make such regulations and issue such orders as he deems necessary to obtain the information required by this paragraph from cities and towns in which the method of collecting statistics meets the approval of the board of health of the province.

"3059g. The forms to be used for the certificates of death and for the annual reports of births and marriages, the prepaid envelopes for the monthly or annual returns, are furnished and forwarded free to those entitled to them by the Board of Health of the Province.

"3059h. Any person who knowingly makes a false report concerning any facts which are required to be reported in virtue of this

paragraph to the person entrusted with the registration of acts of civil status, or to the secretary-treasurer of a municipality, shall, upon conviction before a justice of the peace, be liable to a fine not exceeding fifty dollars.

Whosoever is obliged by this paragraph to report to the person having charge of the registration of the acts of civil status, or to the secretary-treasurer of a municipality, any birth, marriage or death, or any cause of death, and who refuses or neglects so to report is liable to a fine not exceeding twenty dollars.

Prosecutions under this paragraph shall be instituted within two years after the offense was committed."

2. This act shall come into force on the day of its sanction.

SCHEDULE A. RETURN OF BIRTHS FOR THE YEAR . . . }

Name of the municipality in which }  
the births have taken place }

County of . . . . .

TOTAL . . . . . SEX { M . . . . .  
F . . . . .

I certify that the above is a true statement of entries made in the registers of Acts of Civil Status for the year 189 . .

Dated at . . . . ., under my hand, the . . . . . 189 . .

(Signature) . . . . .

(Official position) . . . . .



## SCHEDULE B. RETURN OF MARRIAGES FOR THE YEAR . . . .

Name of the municipality in which }  
the marriages were celebrated }

County of . . . . .

TOTAL MARRIAGES . . . . .

I certify that the above is a true statement of entries made in the registers of Acts of Civil Status for the year 189 . .

Dated at . . . . ., under my hand, the . . . . . 189 . .

(Signature) . . . . .

(Official position) . . . . .

## SCHEDULE C.

## CERTIFICATE OF DEATH.

Name of the municipality in which }  
the death has taken place }

County of . . . . .

Name and surname of the deceased.	Age.	Sex.	Nationality.	Profession or calling.	Date of the death.	Duration of illness.	Cause of death.

I, undersigned certify that the above statement is correct.

Dated at . . . . ., the . . . . . 189 . .

. . . . .

**Wisconsin—**

Dr. Wingate: In order to give an idea of the progress being made in sanitary work in the State of Wisconsin, it is necessary to refer briefly to the history of the organization of the State board of health in that State.

The board, consisting of seven members, each appointed by the Governor for a period of seven years, was created by act of the Legislature in March, 1876. At that time the population of Wisconsin was a little over 1,000,000 and the only attempt at sanitation was in the city of Milwaukee, which then had a population of about 70,000, where a board of health had been organized. Since that time (twenty years) the state board has endeavored to have such legislation enacted as would provide for local boards of health throughout the state and, at the present time, there are nearly 1,200 organized local boards of health in existence.

The law is mandatory that a local board of health shall be organized within thirty days after each election in every city, village and town in the state, and with the exception of sparsely populated farming districts, where the inhabitants live a great distance apart, this law is complied with.

The function of the state board under the existing law is chiefly advisory to local boards; it is required by law to meet twice a year, and oftener if thought advisable by the president or any three members. The secretary is the executive officer of the board, and the only member who receives any pay for services; the other members receive their annual traveling expenses only. Each year the secretary writes to each of the seventy county clerks and obtains from him the addresses of all of the city, village and town clerks in his county, and these in turn are written to, and in reply give the state board the names and addresses of the members of each local board of health. The health officer under the law is the executive officer of the local board, and when possible he must be a reputable physician.

After these returns and entries are made, the chief work of the state board consists throughout the year in corresponding with these local boards of health and advising with them in all matters pertaining to sanitary conditions in their jurisdiction. This work requires a large amount of correspondence containing opinions both sanitary and legal, which require a great deal of thought and study, all of which falls on the secretary and his office force. The board furnishes, out of its appropriation, a library for the use of the secretary in his work, which now contains 1,325 bound volumes and 342 pamphlets consisting of reports of other health boards and works purchased, together with bound volumes of magazines and journals which relate to medical and sanitary matters, and are considered necessary for reference.

The local boards of health have absolute quarantine powers in their jurisdiction, and as a rule, they exercise these powers whenever they or the state board of health deem it necessary. The state board is also possessed of quarantine powers if it chooses to exercise them. The state board also has power to issue arbitrary rules and regulations, which may supersede the regulations of the local boards throughout the state, but generally it prefers to work through the local boards and never to interfere with them, except to advise them, and see that they are working in the correct legal lines. In case the local boards of health decline, refuse, neglect to take proper action to protect the people from dangerous contagious diseases, the state board has power under the law to send its agents there and assume control of the situation, and the expense of the same must be paid by the town, village or city, on behalf of which such services are rendered, but this is very rarely called for.

The state board has done considerable work in issuing circulars pertaining to the care and control of contagious diseases, namely, circulars in diphtheria, scarlet fever, smallpox and tuberculosis. The latter circular was promulgated about two years ago, and a great demand for it has been made, necessitating a large supply, and we believe it has been distributed with good results. It has also adopted and published rules relative to the disinterment and transportation of the dead, which conform to those published by most of the other state boards, and within the past two years has adopted and published more stringent rules relative to reporting, quarantining and disinfecting in contagious diseases.

Under the law the board is required, whenever called upon, or whenever it deems it advisable, to advise local authorities relative to the construction, sanitary condition, etc., of any public buildings belonging to the state, such as asylums, prisons, schools, also relative to water supply and sewerage disposal, etc., and it has often been called upon to advise in these matters. During the past year an effort has been made to push the work in the line of the examination of drinking water. The supply of pure water and the disposal of sewage are perhaps the two most important sanitary problems confronting us in the state at the present time. Under the law, the chemist of the food and dairy commissioner, is obliged to make any chemical analysis of food and drink required by the state board of health free of expense. The bacteriologist of the state university has been made by the board consulting bacteriologist, and is now engaged in the biological analysis of samples of water for the state board whenever required, but the expense of this work has to come out of the appropriation of the board, which at the present time is so limited that we fear but little work in this direction can be done, certainly less than we wish to do. The present appropriation

board is \$5,500 per annum. The secretary's office has one clerk who is a stenographer, and one messenger boy, who with the secretary have to do all of the work. Their salaries, which are fixed by the board, all come out of the appropriation, also all other expenses of the board except printing the biennial reports, which are limited by law to 200 pages, and are paid for by the state, and chemical analysis made by the state chemist before referred to. This small office force is certainly insufficient to continue the work as the board desires for a population of nearly, if not quite 2,000,000, having doubled during the past twenty years, and with sanitary problems continually arising which must demand in the near future more attention than in the past, as the density of the population increases. A larger working appropriation will be asked for from the next legislature. There is a contingent fund amounting to \$50,000 for two years set aside by the legislature, but can only be used by the state board on approval of the governor, in case of any great epidemic of contagious diseases. This fund is generally known as the cholera fund.

The state board of Wisconsin congratulates itself upon one thing, and that is, the laws governing its functions are such that it confines its duties entirely to sanitary matters proper. It has nothing whatever to do with medical schools or colleges, or with any examining boards; neither has it anything to do with diseased animals in the state, or with adulterated foods, etc. The state veterinarian has charge of all the diseases which may affect animals, but is obliged to co-operate with the state board of health relating to any diseases which may affect both animals and men. The food and dairy commissioner has charge of all food and drug alterations and his chemist is obliged to co-operate with the state board in any way that board deems advisable relative to any chemical analysis that the board desires to make.

At the present time harmony exists between the state and local boards of health, and an effort is continually being put forth on the part of the state board to stimulate, encourage and sustain local boards of health in the performance of their duties in every legitimate way, and to keep the whole organization in such a condition that it may all work in harmony for the best interests of the whole people of the state.

There is need of amendments to some of the laws now on the statute books, especially those which relate to vital statistics, which are dead letters and are of no practical use at the present time. At the next session of the legislature bills will be introduced to enlarge somewhat the scope of the functions of the state board, especially in this regard, and a hope is entertained that some advancement in this direction may be realized.

Perhaps I should refer to the vaccination rule promulgated by the board in 1894, requiring all children to be vaccinated before being enrolled in any public or private schools. The law is very plain that the state board has power to make such rules, and that such rules have the force of law throughout the state. It is the opinion of some of our ablest lawyers that this act is constitutional, but within the past year this matter was contested and a lower court has decided that the law is unconstitutional, and the rule null and void. The matter has been appealed to the supreme court, and we are awaiting the decision of that body, which must be final. Since the rule was adopted, however, much vaccination has been accomplished in the state.

In conclusion, I think it is safe to say that the policy of the state board of health of Wisconsin has been, and is, to make haste slowly, recognizing that many questions in sanitation are not yet fully settled, and under such circumstances the safer way is to advance only on sure and well settled lines of progress, always endeavoring in the advance to create a wholesome public sentiment, which must exist before laws can be enacted and enforced. In a state whose population is so cosmopolitan as that of Wisconsin, the growth and progress of sanitation must necessarily be slow, but the state board feels that the progress made, when fully understood and realized, is to say the least, encouraging.

The discussion of this question then followed:

a. "Is it not possible to have uniformity of laws and rules for the transportation of corpses?"

b. "Does not sanitary science provide sufficient knowledge and skill to transport a corpse dead of any disease in such a manner as to be safe to the public?"

Your secretary took the grounds founded on personal experience during the last year, that it is not desirable to relax our precautions in this respect.

Valuable papers were then read as follows:

#### WHAT SHALL BE DONE WITH IMMIGRANTS WHO ARRIVE ON VESSELS INFECTED WITH SMALLPOX?

By Dr. J. W. Scott, Secretary of the Illinois State Board of Health.

#### HOW TO OBTAIN THE VITAL STATISTICS OF A STATE—SUGGESTIONS IN OPENING A DISCUSSION.

By Henry B. Baker, M. D., Secretary of the Michigan State Board of Health.

In the evening the conference had the pleasure of listening to an address by the Hon. Lyman E. Cooley, C. E., of the United States deep waterways commission, on "The Sanitary Aspect of the Chicago Drainage Channel."

On the second day the following paper was read and discussed:

**HOW MAY CITIES OBTAIN POTABLE WATER WHEN COMPELLED TO  
DEPEND UPON RIVERS POLLUTED BY SEWAGE FOR THEIR SUP-  
PLY?**

By Dr. Gardner T. Swarts, Secretary of the Rhode Island State Board of Health.

The committee on vaccination reported the following resolution, which was unanimously passed:

Resolved, That on this, the anniversary of the centennial year of the discovery of vaccination by Jenner, this association gladly commemorates that event by the formal and deliberate statement of its absolute confidence in vaccination with typical humanized or animal lymph as the only known preventative of small-pox, without which that disease would again attain the proportions of a terrible plague.

(Signed)

CHARLES N. HEWITT,  
L. P. CHAPELLE,  
HENRY B. BAKER.

A recess was then taken in order to visit the immense drainage canal now in process of construction for the purpose of diverting the sewage of Chicago into the Mississippi Valley, and an address was delivered by Hon. B. A. Eckhart, president board of trustees, sanitary district of Chicago, descriptive of the history of the enterprise.

After President Eckhart's address, responses were made by President Taylor and Vice President Ruggles of the conference.

At the fourth session on the morning of Friday.

The first paper was on the question proposed by the State Board of Health of Alabama, "A National Department of Public Health; is such an institution desirable; and what should be its functions and its relations to the state boards of health."

In the absence of Dr. J. N. McCormack, of Kentucky, Dr. Cochran of Alabama addressed the conference, taking the ground that the most practical method of solving this problem was co-operation with the United States Marine Hospital Service.

Dr. Cochran: I think this is really a question of great practical importance, and I am very sorry that there is not a larger number of the members of the conference present. The various medical bodies in the country have been passing resolutions in favor of a National Department of Health. With two exceptions none of these medical bodies have formulated any plans for presenting the matter to Congress, and their resolutions have had very little influence in any way. The two exceptions are the American Medical Association and the New York Academy of Medicine. Both of these bodies drafted bills and presented them to Congress several years ago. They were bills of very widely different character and very naturally.

The following resolutions were then adopted:

"Whereas, It is reported to this conference that, upon several occasions immigrants from infected vessels have found their way to their homes in the cities of the interior without the knowledge of the health officers of said cities; and in certain instances said immigrants have not shown evidence of having been satisfactorily vaccinated; therefore,

"Be it resolved, That in the opinion of the conference of state boards of health assembled at Chicago, June 11-13, 1896, that the public safety demands that a prompt and correct report of the names and destination and routes to be taken by immigrants landed from infected vessels, be made by the port quarantine officials, to the state boards of health of the interior where said immigrants are expected to arrive; and that in the opinion of the conference every emigrant should be vaccinated at the port of departure.

Whereas, The modification by the Postmaster General of the United States of the order issued January 1, 1893, which prohibited the transportation through the mails of all specimens of diseased tissues, "no matter how securely put up," has, by the terms of order No. 88, dated February 5, 1896, which permits the use of the mails for the transmission in specified packages, of specimens for bacteriological examination for diagnosis, greatly facilitated the early and positive identification of certain dangerous communicable diseases; and,

Whereas, It has been found to be practicable to dispense with all culture media in the transportation of specimens for bacteriological examination in cases of suspected diphtheria, and to transmit such specimens by the aid of dry cotton only; therefore,

Be it resolved, That the Postmaster General be respectfully requested to admit to the mails a package constructed as follows:

1. A glass vial one-half inch in diameter, and two and three-quarters inches in length (said vial to contain the infected cotton.)
2. Said vial to be packed in cotton and inclosed in a strong cylindrical paper box. Said box to have moulded cover, and to be not less than three-sixteenths of one inch in thickness.

Your secretary then offered the following amendment to the Constitution.

That the section relating to membership be amended by the insertion after the words "State Boards of Health" of the following "and the quarantine physicians, national, state and municipal, of the various ports."

An amendment was offered to include the Republic of Mexico, and

to change the name to American instead of National Conference, which was accepted.

Your secretary also offered the following resolution:

"Resolved, That the secretary be requested to print with each annual program a full list of the officers and members of the several state and provincial boards of health," which was carried.

The following paper was then read:

**SHOULD THE STATE AND PROVINCIAL BOARDS OF HEALTH HAVE SUPERVISION AND BE RESPONSIBLE FOR THE QUALITY OF ANTI-TOXINES MANUFACTURED OR USED WITHIN THEIR RESPECTIVE STATES OR PROVINCES?**

By Dr. C. A. Lindsley, Secretary State Board of Health of Connecticut.

The following resolution was then adopted by a rising vote:

Whereas, Dr. C. N. Metcalfe, for many years secretary of the Indiana State Board of Health, and one of the members of this conference, who participated in its organization and was constant and active in advancing its objects, has since our last meeting passed from among us; therefore, be it

"Resolved, That this organization express in a memorial page, to be included in the record of the proceedings of this meeting, its appreciation of his services to this body and the cause which it represents."

The question proposed by the state board of Ohio: "Is it necessary to use isolation, placarding or other quarantine restrictions in the prevention of typhoid fever?" was then discussed, the general opinion being that such restrictions were unnecessary. The following resolution, condemnatory of the efforts to obtain the passage of an anti-vivisection law by congress was then offered:

"Resolved, That the National Conference of State Boards of Health protests against the passage of the bill in which it is proposed to regulate and restrict the practice of experimentation on animals in the District of Columbia, when such experiments are performed for the discovery of the laws upon which depend the preservation of health or prevention of disease."

This resolution was adopted as the sense of the Conference.

The next paper:

**HOW FAR SHALL THE STATE BOARD OF HEALTH HAVE CONTROL OF THE MANUFACTURE AND SALE OF MILK PRODUCTS, ESPECIALLY THE DAIRY MILK SUPPLY?**

By Henry Mitchell, M. D., Secretary of the State Board of Health of New Jersey.

The above paper was read by title, as was also the following:

**WHAT ARE THE PROPER LIMITS TO THE FUNCTIONS OF STATE BOARDS OF HEALTH IN DEALING WITH QUESTIONS OF LOCAL SANITARY ADMINISTRATION?**

By U. O. B. Wingate, M. D., Secretary of the State Board of Health of Wisconsin.



Dr. C. A. Ruggles, of California, was elected president for the ensuing year; Dr. Benjamin Lee, of Pennsylvania, vice president, and Dr. C. O. Probst, of Ohio, secretary and treasurer. The executive committee announced that in response to the invitations of the Governor and president of the State Board of Health and other officials of the State of Tennessee, Nashville had been selected as the next place of meeting.

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REPORT OF DR. BENJAMIN LEE, SECRETARY, AS DELEGATE  
TO THE TWENTY-FOURTH ANNUAL MEETING OF THE  
AMERICAN PUBLIC HEALTH ASSOCIATION.

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The twenty-fourth annual meeting of this large and influential association took place in the city of Buffalo, September 15-18, 1896. There were between three and four hundred members in attendance.

Dr. Eduardo Liceaga, permanent president of the Superior Board of Health of the Republic of Mexico, and president of the association called the meeting to order.

Lieutenant-Colonel Alfred A. Woodhull, U. S. A., seated by President Liceaga, who does not speak English, announced Dr. Stephen Smith, one of the organizers of the American Public Health Association in 1872. Dr. Smith spoke of the men who were interested in the organization in its early days, especially emphasizing the fact that only international co-operation can effectually cope with epidemics. He suggested that Cuba be taken into the association and that such a move would be beneficial to all when yellow fever is to be fought. There civic cleanliness might be increased and the chances of epidemic in the Western Hemisphere be decreased. Dr. Smith dwelt upon the influence of the association upon the sanitary conditions of America and what might be done by it in the future.

The secretary, Dr. Watson, of Concord, N. H., on behalf of the executive committee suggested the naming of these new committees: On sanitation, with especial reference to drainage, plumbing and ventilation of public and private buildings; on disinfection and disinfectants. Suggestions adopted. Committees to be made up of five members to be later named by the president.

About fifty new members were elected upon recommendation of

the executive committee, the secretary casting one ballot for the unread list of names.

Dr. Granville P. Conn's report of the committee on car sanitation was read by Dr. Probst. The practice of closing railway cars when in yards was condemned; dry closets were recommended; care for the selection of intelligent cleaners of cars was suggested; the added expense would be compensated for by the added popularity of the best-cleaned railway. Discussion was deferred till the close of other papers on car sanitation.

Then followed Dr. Orvananos, on Observations on the Cleaning of Railroad Passenger Cars. In his article the complicated style of construction, with its ornaments and profuse upholstering, was criticised as making a thorough cleansing almost impossible; change and disinfection of carpets and upholstery every twelve hours and greater care in cleaning were suggested as remedies.

The brief paper on "Contagion of Venereal Diseases in Railroad Cars," prepared by Dr. Noriega, of Mexico, was read by Dr. Lindsley, of Connecticut. The history of several cases of contagion of this character by means of lavatory closets and bedding of cars was recited. It was recommended that beds be periodically washed and disinfected, the clothing daily changed, the lavatory and closets cleansed by an antiseptic after each use, that the latter be equipped with paper seats to be destroyed immediately after use.

Dr. Frederick Montizambert, of Toronto, general superintendent of quarantines of the Dominion of Canada, presented the report of the committee on steamboats and steamship sanitation.

The next paper read was by Dr. James F. Kennedy, of Des Moines, Ia., on "The Composition and Infectiousness of Milk." Dr. Kennedy is the secretary of the State Board of Health of Iowa. He went into details regarding the composition of milk, and declared that it contains in proper proportions all of the elements of food, and would sustain life longer than any other known food. Instances of persons who had lived for years on milk diet alone were cited.

The percentages of deaths among children fed on cow's milk, said Dr. Kennedy, is much greater than among those naturally nourished. The cause of many such deaths is inanition, the milk being deprived of its nutritious qualities by dilution with water, which is not only a fraud against the buyer of the milk, but a crime against the children who have to drink the milk, for they are literally starved to death. Nevertheless, Dr. Kennedy thought that the greatest danger from milk was not from its dilution, but from the disease germs which it might contain and carry to human beings. He mentioned tuberculosis as one of the most important of these diseases, and one which was frequently transmitted in this way. Typhoid fever is also carried by

milk, which may be infected by washing the cans or diluting the milk with polluted water, by the cows drinking polluted water and by other means of infection. Diphtheria and scarlet fever are also carried in milk. Dr. Kennedy recommended the most careful and rigid inspection of all sources of milk supply, and the dissemination of information regarding the dangers of infection from this source, also that all milk used should be thoroughly sterilized.

Dr. Gardner T. Swarts, of Providence, secretary of the State Board of Health of Rhode Island, had prepared no paper on the topic assigned to him. "Pure Milk," but he spoke briefly, declaring that one of his reasons for not preparing the thesis was because he was coming into a community where he knew much attention had been paid to the subject of pure milk. He recommended for the purification of milk supplies that farms should be established, similar to one that is near this city, where all of the modus operandi of milking and delivering the milk is carried out under the most healthful conditions and the purity of the milk is certified to by reputable physicians. The price of such milk, he said, must of necessity be higher, and it is only by educating the public that they can be made to pay the difference, and so secure immunity from disease, which is more surely secured this way than by sterilization.

Dr. D. E. Salmon, D. V. M., chief of the Bureau of Animal Industry of the Department of Agriculture at Washington, presented the report of the committee on "Animal Diseases and Animal Food." He reported that the European disease anthrax, a most fatal malady, is becoming more prevalent in this country, and suggested means for suppressing it, by carefully burning the bodies of all animals that die from it, instead of leaving them where the contagion could be spread to others or conveyed to the soil. Tuberculosis, he said, is now the subject of much attention on the part of the Government, which can, however, only prohibit the shipment of diseased meat to other states, and not its local sale. Most of the large abattoirs, however, will not place on sale meat which the Government inspectors have declared unhealthy, but some of them still do so.

An interesting portion of the report dealt with the subject of rabies or hydrophobia. Dr. Salmon held that the opinion of many that no such disease exists is false, and that it not only exists, but is a common menace to public health and safety. He recommended the destruction of all worthless dogs and the muzzling of all others allowed to run at large.

The discussion which followed the group of papers was joined in by your secretary, who took issue with Dr. Kennedy regarding the sterilization of milk and declared that it caused rickets and infantile scurvy, both of which diseases had become comparatively common

since the introduction of the scheme of sterilization. Dr. Hibbard of Indiana did not think that any cases of tuberculosis could be traced to milk supplies, and Dr. Lyman, of Massachusetts, said that the best means of preventing such contagion was not only to look out for the quality of the milk, but to get plenty of pure air, proper food and clothing and sufficient sleep and exercise, so as to keep the body in a healthy condition. Dr. Carter, of Des Moines, Ia., thought the shotgun was better than the muzzle for the prevention of hydrophobia. Dr. Holton, of Brattleboro, Vt., thought the talk about tubercular infection in milk was likely to alarm the public unnecessarily. Dr. Kenyon cited cases of infection of tuberculosis from milk, and Dr. Salmon replied to Drs. Hibbard and Holton in a similar strain.

The paper on "Contributions to the Study of the Pathogeny, Etiology and Prophylaxis of Typhus," by Dr. Francisco De P. Bernaldez, delegate from the State of Oaxaca, Mexico, was read by Dr. Kenyon. It was an able scientific presentation of the subject, based on personal observations in many epidemics. There was no discussion of the paper.

Dr. A. Walter Suiter, of Herkimer, read the next report, prepared by Dr. Samuel W. Abbott, of Wakefield, Mass., secretary of the Massachusetts State Board of Health, as chairman of the committee on nomenclature and forms of statistics.

Dr. Liceaga's paper on "Nomenclature of Diseases and Forms of Statistics" was also of considerable technical interest and was read by his son, who speaks English fluently.

Dr. Jesus E. Monjaras, of San Luis Potosi, Mexico, director of hygiene of the State of San Luis Potosi, followed with an excellent paper on the "Need of Uniformity in the Meaning of the Term 'Still-born.'" He was followed by Dr. Henry R. Horlbeck, health officer of Charleston, S. C., who presented a paper on "Dengue or Break-bone Fever," a disease prevalent along the southern coast.

The final paper of the day, by Mrs. Ellen H. Richards of the Institute of Technology, Boston, was read by Dr. I. H. Durgin, health officer of Boston. The subject of the paper was "Municipal Responsibility for Healthy School-houses," and it took the ground that the city is just as responsible for the safety of those who are compelled to remain in its buildings as it is for the safety of those who have to cross its bridges.

The address of the president was delivered in the evening following a welcome from his Honor, Mayor Jewett of Buffalo and other addresses.

President Liceaga's address, from the view point of a sanitarian, was an able and forceful paper. It was written in English by the president of the association, but was read by Dr. A. L. Gihon, U. S. N., a former president of the body. It related principally to the

business of the association, and went into a history of the growth and development of the study of public hygiene in Mexico, which Dr. Liceaga said had been fostered and encouraged under the administration of President Diaz during the last twenty years.

Some of the suggestions made by Dr. Liceaga were of great value and interest. He laid before the association the proposition that it should devote special attention to the study of contagious diseases, with a view not only to their cure and the prevention of epidemics, but to public means of preventing the development of individual cases. The several phases of the subject of epidemics were taken up separately and treated in an exhaustive manner. One proposition put forth by Dr. Liceaga was that isolation in infectious diseases is not as essential in some diseases as others, and that the study of the extent to which it should be practised would repay investigation. Another proposition was that more attention should be paid to the study of the technique of disinfection. These and many other phases of the broad subject of contagion could be studied by uniform methods over a vast extent of territory by the members of the association, with valuable results.

Another question which Dr. Liceaga thinks merits investigation is the ascertainment of the period within which any disease is contagious and the person affected dangerous to his neighbors. This is something in regard to which much uncertainty still exists, and definite knowledge in this regard would be of incalculable value, Dr. Liceaga recommended also that a special committee for the investigation of the subject of the prevention of disease, particularly by vaccination and inoculation, should be appointed, and made reference to the newly-developed sero-therapia, or treatment by inoculation with serum, which he declared was already falling into disrepute through the use of imperfect or contaminated serum. A committee to devise a means for the use and sale of only absolutely pure and perfect serum should be appointed, he declared.

On the second day your secretary presented a paper under the title the "The Quick or the Dead," calling attention to the fact that "There has lately appeared a tendency among certain prominent sanitarians to relax precautions for the prevention of the spread of contagion in the transportation of bodies dead of infectious diseases. They claim that a dead body can be treated so that no germs will remain. This is not the case, and a body, even after the most anti-septic treatment may carry the germs of disease."

He cited several cases that had come under his observation, where the germs had been carried in the wood of the coffin, and others where a cradle in which a child had died with scarlet fever had infected a whole family two years later, and closed by saying :

"The true solution of the problem is the cremation of all con-

tagious corpses. The ashes of such a body can be carried anywhere without danger. It would be well for all if we could quit our habit of thinking that what we say of the dead or our conduct toward them is of more weight than what we say of the living or our treatment of them."

This paper followed the report of the committee on transportation and disposal of the dead, which was presented by the chairman, Dr. Charles O. Probst of Columbus, Ohio, secretary of the State Board of Health of Ohio. The report took different ground in some important particulars from that assumed by Dr. Lee and was in substance as follows:

No additional recommendations regarding the disposal of the dead were made. In regard to transportation, the committee was of the opinion that it is quite possible to prepare a body, dead of an infectious disease, so as to make it transportable without any danger of infection, and that it is the duty of the association to develop the simplest methods by which this end can be attained, in order that the sentiment of respect for the dead may be maintained without danger to the living. If, however, all dead bodies are to be allowed transportation, it would be necessary, the committee thought, to provide that the preparation of bodies should be made under the supervision of the proper health authorities. "The friends accompanying the dead," concluded the report, "are often more dangerous than the corpse."

The report of the committee on the Disposal of Garbage was presented by Rudolph Hering, C. E., former engineer member of our own board. Although it presented an immense fund of information on the subject the committee asked to be continued in order to avail itself of the report of a similar committee in Europe.

Col. William F. Morse, of New York, read a paper on the same subject, recommending a form of cremation by an attachment in the stovepipe, turning the solid portions of the garbage into charcoal, while evaporating the liquids.

Dr. M. E. Woodin, of Bridgeport, Connecticut, presented a paper on "A Plea for the Domestic Disposal of Garbage." Dr. Woodin is a member of the State Board of Health of Connecticut and in his paper were embodied many valuable suggestions as to the best means of disposing of household refuse.

Dr. Woodin showed through models the practical methods of household disposition of garbage. There were a number of devices shown, all of them practical, economical and sanitary. Dr. Woodin said that one of the models, which was on exhibition in Buffalo, was an apparatus which could be used to great advantage in the country, in military posts and in other places where plumbing could not be secured. The model to which Dr. Woodin

referred could be used both for garbage and for other refuse, successfully disposing of all refuse by consumption by fire.

The discussion of this subject was very generally participated in. At the request of your secretary, Dr. William Varian, president of the Board of Health of Titusville, Pa., described the method of domestic cremation of garbage by means of natural gas as followed in that city with great success.

Dr. Gihon, U. S. N., suggested that if we wasted less food we should create less garbage. The general consensus of opinion was that cremation was the only solution of the problem.

The afternoon session began with the reading of the papers deferred from the morning. They were: "On Measures for the Prevention of Blindness," by Dr. Augustin Chacon, of the State of Aguas Calientes, Mexico, vice president of the Ophthalmological Society of Mexico; "Miasmatic Fevers in the State of Sonora," by Dr. Alberto G. Noriega, of Sonora, Mexico, and "Summary of Sanitary Legislation in the State of Mexico," by Dr. Maximiliano Alvarez, of Mexico. All of these papers were read by Dr. Gihon. That of Dr. Chacon declared that a large percentage of all cases of blindness was preventable, and recommended means of preventing the same, particularly by paying attention to the books used by children in school, as to the size of type; color of paper, length of lines and distance between lines. He also recommended that regulations to govern the sale of spectacles similar to those regulating the sale of drugs should be adopted, so that the relation between oculist and optician should be the same as between physician and pharmacist. In discussing the paper, Dr. Lucien Howe, of Buffalo, agreed with Dr. Chacon in regard to the proportion of cases of unnecessary blindness, and introduced two resolutions, which were referred to the executive committee. The resolutions recommended the adoption of Crede's method of preventing blindness by putting a drop of nitrate of silver in the eyes of newly-born infants, in all institutions supported by the public, and approved the laws requiring the reporting of all cases of purulent ophthalmia in the new-born by nurses and midwives. Dr. Valentine, of New York, also joined in the discussion.

The report of the committee on national health legislation was omitted. Then followed three papers bearing upon the question of such legislation: "Obiter Dicta Concerning Sanitary Organization," by Dr. A. Walter Suiter, of Herkimer, N. Y.; "Some Thoughts Relative to National Health Legislation," by Dr. U. O. B. Wingate, of Milwaukee, Wis., secretary of the State Board of Health of Wisconsin; "On the Sanitary Administration of Unincorporated Districts," by Dr. Henry Mitchell, of Trenton, New Jersey, secretary of the State Board of Health of New Jersey.

Several prominent representatives from various States took part in the open discussion which followed. At the close a resolution was offered by Dr. Wingate, that efforts be continued to influence the Congress of the United States to establish a department of public health at Washington, D. C., and to this end it was recommended that the powers of the Marine Hospital service be enlarged, and so organized as to provide for an advisory council composed of representatives from the state boards of health. This matter was referred to the advisory committee.

A report was made through the chairman, Dr. Felix Formento, of New Orleans, member of the State Board of Health of Louisiana, of the International Committee on the Prevention of the Spread of Yellow Fever. Dr. Eduardo Liceaga, of the City of Mexico, read his paper on the "Study of Yellow Fever."

On the third morning were presented the following important reports:

Report of the committee on "The Pollution of Water Supplies," by Maj. Charles Smart, Surgeon General United States Army, Washington, D. C., chairman.

Report of committee on "River Conservancy Boards of Supervision," by Dr. Peter H. Bryce, of Toronto, Canada, chairman, secretary of the Provincial Board of Health, Ontario.

Report of committee on "Protective Inoculations in Infectious Diseases," by Dr. Charles N. Hewitt, of Red Wing, Minn., chairman, secretary of the State Board of Health of Minnesota.

Two interesting papers on typhoid fever then followed—"The Serum Diagnosis Test for Typhoid Fever," by Dr. Wyatt Johnston, of Montreal, Canada, bacteriologist to the Provincial Board of Health of Quebec; "Prophylaxis of Typhoid Fever," by Dr. J. Eliot Woodbridge, of Cleveland, O.

The new disinfectant formaldehyde was discussed in three papers, with demonstrations, and the subject created much interest—"Practical Use of Formic Aldehyde as a Disinfectant," by Prof. Franklin C. Robinson, of Brunswick, Me., professor of chemistry in Bowdoin College and member of the State Board of Health of Maine; "Preliminary Note on the Use of Formaldehyde for Room and Car Disinfection, Etc.," by Surgeon J. J. Kinyoun, U. S. M. Hospital Service, of Washington, D. C.; "A Convenient Lamp for Generating Formaldehyde Gas," by E. A. De Schweinitz, M. D., Ph. D., of the Bureau of Animal Industry, Department of Agriculture, Washington, D. C.

Then followed papers "On Prophylaxis of Paludism," by Dr. Alfonso Ruiz Erdozain, delegate from the State of Hidalgo, Mexico; "Brief Notes on Public Hygiene in the State of Tamaulipas," by Dr. C. Laredo, delegate from the State of Tamaulipas, Mexico; "On



Public Health in Tabasco, Mexico," by Dr. Juan Muldson, delegate from the State of Tabasco, Mexico; "On Sanitation in Hospitals for the Insane," by Prof. George H. Rohe, of Springfield, Md., superintendent of the Second Hospital for the Insane of the State of Maryland.

At the afternoon session the report of committee on "The Cause and Prevention of Diphtheria," by Dr. J. J. Kinyoun, of Washington, D. C., Surgeon United States Marine Hospital Service, chairman, was listened to with close attention. This paper, like all others on this subject, expressed great confidence in the efficacy of serotherapy in the treatment of this disease. At the same session interesting papers were presented as follows: "On Diphtheria in Chihuahua," by Dr. Miguel Marquez, delegate from the State of Chihuahua, Mexico; "On Bacteriological Diagnosis as Governing the Admission and Discharge of Patients in Diphtheria Hospitals," by Prof. E. B. Shuttleworth, of Trinity Medical College, Toronto, Canada; "Should Measles be Quarantined?" by Dr. Henry M. Bracken, professor of materia medica, therapeutics and clinical medicine in the University of Minnesota. Report of committee on "Causes and Prevention of Infant Mortality," by Prof. Charles N. Hewitt, secretary of the State Board of Health of Minnesota; "On Mortality of Infants, the Causes and Means of Diminishing It," by Dr. Salvador Garciadiego, delegate from the State of Jalisco, Mexico; "On Diarrhoea of Children," by Dr. Jose M. Banitez, delegate from the State of Guadalajara, Mexico.

In the evening a paper "On the Bicycle in its Sanitary Aspect," by Albert L. Gihon, medical director United States Navy (retired), in the usual lively and vigorous style of that writer, created both amusement and hot discussion, the wheel being attacked by the essayist and defended by Dr. Eliza Mosier, professor of hygiene in the University of Michigan.

Of great interest was also the report of the committee on the use of alcoholic drinks from a sanitary standpoint, by Dr. Formento. The report took the view that the condemnation of all alcoholic drinks and confusing the moderate drinker of wine or beer with the habitual drunkard, by temperance agitators, was extremely harmful, and tended to increase the temptation to taste the forbidden fruit, and that the regular and moderate use of light drinks is the best means of combating the evil of drunkenness. In wine-growing countries, the report said, where wine formed a part of every meal, there is no such thing as drunkenness. As the most practical remedies for the abuse of alcohol, the committee recommended increasing the taxes on strong drinks, the prohibition of adulteration, the removal of all taxes on light wines, beer, ~~cider~~

and coffee, high city licenses, a sanitary inspection of all drinks sold over the bar, the encouragement of the culture of grapes and the manufacture of pure wines.

The paper of Dr. Carlos Santa-Maria, of Durango, Mexico," on "The Part that Public Instruction Should Have in the Way of Precaution Against Contagious Diseases," was read in Spanish. It was a plea for the general teaching in the public schools of the rudiments of the hygiene of disease, as well as of the body in health.

The paper of Dr. H. Lincoln Chase, agent of the Board of Health of Brookline, Mass., on "Public Bathing Establishments with a Description of the New Public Bath in Brookline," was an able and interesting account of the establishment of a free bath in a small city.

It was followed by an illustrated lecture on "Public Baths," by Dr. W. H. Tolman, of New York, which went into the history of public baths, giving illustrations of those used by the ancient Greeks and Romans, and showing views as well of some more modern institutions of the kind. Illustrations of some Buffalo tenement houses, from photographs taken by the local health officials, were also shown in contrast with the wash houses of London and Paris.

On the morning of the fourth and last day, the following reports were presented: Report of committee on "The Relation of Forestry to Public Health," by Prof. Robert C. Kedzie, of the Agricultural College, Lansing, Mich., chairman; report of committee on "Transportation of Diseased Tissues by Mail," by Dr. Henry Mitchell, of Trenton, N. J., secretary of the State Board of Health of New Jersey, chairman.

In connection with this report your secretary offered a resolution of thanks to the Postmaster General for his intelligent appreciation of the importance of this subject and his readiness to modify his rules in such a way as to permit of the transportation of such specimens for the purposes of bacteriological diagnosis, under certain specified restrictions. The resolution was adopted.

The reading of the following papers completed this very full and interesting program: "On Statistics of Vaccination and Mortality from Smallpox in the City of Mexico, 1872-1895," by Dr. Jose Ramirez, delegate from the State of Yucatan, Mexico; "On Drunkenness a Vice: it Should be So Treated," by Dr. A. Nelson Bell, of Brooklyn, editor of *The Sanitarian*; "On Municipal Cattle and Meat Inspection," by Dr. Peter H. Bryce, of Toronto, Canada, secretary of the Provincial Board of Health of Ontario; "On the Prophylaxis of Scurvy in Prisons by Pulque," by Dr. Francisco Martinez Baca, chief director of the Anthropological Department, etc., in the Normal School of the State of Pueblo, Mexico;" On the Relation of Noises to Public Health," by Dr. William C. Krauss, of

Buffalo, professor of neurology in the Niagara University; "On the Degeneration of the Human Animal Through the Nursery and Schools," by Dr. J. B. Learned, of Florence, Mass.; "On the Importance of Supplies of Pure Water," by Dr. J. L. DeHart, of Brooklyn; "On Racial Deterioration," by Lawrence Irwell, M. A., B. C. L., Buffalo; "The Necessity of Isolating Beds in Hospitals by Means of Windows Between Them," by Dr. Jesus E. Monjaras, of San Luis Potosi, Mexico, delegate from the State of San Luis Potosi; "Filth Deposits With Regard to Public Health," by Drs. Jose D. Morales and R. E. de Guerrero, of Mexico.

Dr. Henry B. Horlbeck, health officer of Charleston, S. C., was elected president and Dr. Peter H. Bryce, secretary of the Provincial Board of Health of Ontario, first vice president, and Dr. Ernest Wende, health commissioner of Buffalo, second vice president for the ensuing year.

The work accomplished in these three days may be summed up as follows: Four addresses, sixteen reports of committees and fifty-three papers with full discussions. The sessions occupied altogether thirty hours. The attendance from Mexico and the British provinces was large.

The Secretary trusts that he did not overstep the limits of his authority as a representative of this Board in inviting the Association to hold its next annual meeting in this State and in the city of Philadelphia. In this invitation he was cordially seconded by His Honor, the mayor of Philadelphia, and Dr. William H. Ford, the president of the Board of Health. As large delegations may be expected from the republic of Mexico, the Dominion of Canada and the other British provinces, it would be entirely fitting that the State Legislature should be appealed to to extend a liberal greeting to this body of distinguished representatives of the science and learning as well as the official administration of our sister nations.

Perhaps the most remarkable feature of this meeting was the object lesson afforded by the city of Buffalo itself of the value of an enlightened sanitary policy. Its abundant supply of pure water, its admirably paved and exquisitely clean streets, its careful regulation of the milk supply, its system of prompt reporting of contagious diseases and its efficient domiciliary quarantine under the energetic control of Dr. Ernest Wende, the health commissioner, as the health officer of the city is styled, have in the space of five years during which he has been in office, reduced the death rate from 19 to 11.67 per 1,000 as shown by the returns of the past six months. Notwithstanding the rapid increase of population the actual number of deaths is less to-day than it was five years ago.

## APPENDIX H.

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### CORRESPONDENCE AND LEGAL OPINIONS.

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1. Opinion in the Salt Water case at Butler. Justice Williams.
2. Decision of His Honor Judge Morrison on Compulsory Vaccination.
3. Decision of the Supreme Court of Michigan on the Duty of Health Authorities to Appraise and Pay for effects destroyed by their orders.
4. Opinion of His Honor M. Russell Thayer, on the legal scope and signification of "Public Streams."
5. Argument of E. H. Mayo, Esq., on "What is a Municipality."
6. Opinion of J. Davis Brodhead, Esq., on course to abate a nuisance caused by cesspool on private property.

#### Correspondence—

Notice of the establishment of a Provincial Board of Health at  
Victoria, B. C., Canada.

Regulations of school rooms.

## LEGAL OPINIONS.

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### OPINION IN THE SALT WATER CASE AT BUTLER.

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The case of the Butler Water Company vs. A. J. Russell, et. al., known as the salt water case, is of considerable importance to oil men, as well as to the water companies. The decision of the Supreme Court by Justice Williams is as follows:

This case presents a public question of very grave consequence which does not seem to have been passed upon in the form in which it is now encountered. A brief statement of the facts by which it is raised will conduce to a readier apprehension of it. The Butler Water Company is a corporation organized under the general corporation act of 1874 to supply the borough of Butler with water. It has been carrying on its business for about seventeen years. The borough of Butler contains at this time a population of about ten thousand and is steadily and rapidly increasing. The water supply is obtained from the Connoquenessing creek which has been, until recently, a stream of reasonably pure water, and is capable of furnishing a sufficient supply. This it has done heretofore except during the excessively dry weather of the summer of 1893 and 1894 when the water became low and muddy. To remedy this difficulty the water company has secured and brought to its pump station the water of a tributary called Bonny Brook. The supply now at command is, in the opinion of the learned judge of the court below, more than sufficient in quantity, and in its native state is reasonably pure in quality. But the basin which is drained by the Connoquenessing, or some portion of it, was thought to be underlaid with oil. The drill was started and some oil was discovered in a stratum known as the "one-hundred-foot sand." The defendants have within a year or so begun to bore wells down to this sand rock. The oil found by them is diffused through the rock mixed with water. The mixture is pumped into large tanks where the oil rises to the surface, while the water, which is about ninety-five to ninety-eight per cent. of the whole, is drawn off at the bottom and allowed to run out upon the surface of the ground. These wells yield not far from twelve to twenty barrels of oil and from eight to twelve hundred barrels of water per day each. From their several wells the defendants are pouring about five thousand barrels of salt water into the stream above the dam of the water company every day; and it would seem that as much or more is turned upon the ground from the wells of other operators who commenced operations since the defendants' wells, or some of them, were finished.

The water of the stream has become so strongly impregnated with salt and other mineral substances in consequence of these operations that the learned judge found the fact to be that the water has become wholly unfit for domestic uses or for steam, and could be utilized only for flushing sewers or extinguishing fires. The results are, a discontinuance of the use of the water by the public, a loss of revenue to the company, an order made by the learned judge required the company to furnish pure water, and an injunction against the collection of any water rents for water furnished for domestic or for steam purposes until pure water is furnished. The defendants have thus destroyed the business and the franchises of the company and the water supply of a town of ten thousand inhabitants. A remedy for the private injury thus sustained by the water company may be looked for in an action at law in the name of the injured party. The remedy for the loss sustained by the public is in a court of equity in the name of the Commonwealth and at the relation of the Attorney General. The object of the first is damages, the object of the second is the assertion and maintenance of the public right. But the interests of the water company, and those of the public, though not identical, are closely related. The furnishing of water to the public is like the furnishing of light and heat for domestic purposes, a "public use;" Mills on Eminent Domain. Par. 18: The importance of which is recognized by the legislative department of the government in granting to the corporations organized to supply or provide for this public use authority to exercise, as the representatives of the Commonwealth, the right of eminent domain. By reason of this public interest in the business of the company the state assumes a visitatorial control over it, inquires into the quantity and quality of the water furnished by it, and makes such orders as may be necessary to secure for the public a wholesome and an adequate supply. The business of the oil and coal operator is a private use. Such business has a certain relation to the general volume of business being carried on in the region, but it is not to be distinguished from the production or manufacture of other commodities in common use, and that enter into the commerce of the country. Such operations may be begun or relinquished, increased or diminished, at the will of the operator without public interference or control; but the supply of water, light and heat is necessary to the health and comfort of densely populated districts and is not left to the absolute control of the companies undertaking to provide it. The state in the exercise of its police power asserts its right to inquire into the efficiency and good faith with which "the public use" is served, and to correct, through the courts, any defects or abuse in the conduct of the business of gathering or dis-

tributing the supply, or of securing a quality of the commodity furnished that is suitable for use. Now we have in this case a somewhat startling state of things.

The learned judge has found in substance that but for the recent introduction of salt water into the stream the Connoquenessing and its tributary, the Bonny Brook, would afford an ample supply of water for the borough of Butler of a reasonably pure quality.

In the case of Brymer et al. vs. The Butler Water Works he has directed the company in the most peremptory manner to provide reasonably pure water, and in sufficient quantity for the public use and enjoined against the collection of rents until this order is obeyed. In this case in which the water company asks the court to protect the stream, on which it is dependent, from contamination, the relief prayed for was refused. "Your business," says the court below, "is a public one, and you must furnish wholesome water to the borough of Butler." When the company seeks the aid of the court to protect the water supply so that it may be able to furnish suitable water, the answer is "your business is a private one; your grievance is for a mere personal inconvenience and for a personal injury;" you are therefore within the rule laid down in *Sanderson vs. The Coal Company* 113 Pa., 126, and you are remediless.

In *Sanderson's* case the coal company had by opening a coal mine on its own land polluted a stream of water used by *Sanderson* for domestic purposes. His grievance was for a "personal inconvenience and a personal injury" suffered as the result of the opening of the mine by one whose land was higher up the stream than his own. It was held that as between two property owners the lower holds subject to the easement which the position of his property imposes, and that he cannot be heard to complain of the inevitable consequences of the development by the higher owner of his own property in a lawful manner and without malice or negligence. So far as the business of the water company may be regarded as a private business, the deductions of the learned judge from *Sanderson vs. The Coal Company* was a legitimate one. The real question raised, however, by the water company was that which was suggested by the character of the business in which it was engaged, the duties which that business imposed, and the obligations to the public that necessarily resulted. Do these considerations relieve to any extent against a rigorous application of the doctrine of *Sanderson vs. The Coal Company* to the plaintiff in this case? This question does not seem to have been considered in the court below. It is raised by the pleadings and the evidence and it should be considered and decided. The more important question, however, and that to which we referred at the outset as new, may be stated thus: Is a city as helpless to protect the water supply on which it depends as

Sanderson was held to be? Does a great municipality stand on the same ground, when the water supply for its multitudes of people is under consideration, as a single property owner must stand, under Sanderson vs. The Coal Company. This question was wholly untouched in the court below because the learned judge denied the Commonwealth which had intervened in behalf of the public the right to be heard.

The fourth finding of law declared that the State was a "party in name only," and that neither "the records nor the evidence disclosed any real plaintiff or complaint other than the water company." Notwithstanding the name of the Commonwealth had been put on the record as a plaintiff at the instance of her Attorney General, and notwithstanding the conclusive evidence of the destruction of the water supply for all domestic purposes, on which the borough of Butler had been dependent for many years, the case was disposed of on the narrow ground covered by the rule in Sanderson's case. The error of the learned judge lies in this treatment of the case. By this we must not be understood as holding that the rule applied by the learned judge is not applicable so far as the "mere personal inconvenience" or injury of the water company is concerned, but that the "public use" served by the company and the public need of an adequate water supply affecting the health and comfort of thousands of citizens have not been considered at all. We cannot now take notice of and determine these questions for there are additional finding both of fact and of law that should be made before this can be intelligently done. Among other subjects to be examined and passed upon are these. What was the situation of the valley or basin of the Connoquenessing when the water company appropriated the stream for the supply of Butler borough? Was it at that time a developed oil field or not? At what date did the pumping of salt water into the stream begin? What is the value of the daily or monthly output of oil by the defendants from their wells? What would be approximate cost of conducting the salt water either by surface drain or by pipes to some point below the plaintiff's dam? Can the salt water be relieved of its salt by subsidence or filtration by the operator before turning it into the stream and if so at what expense? Can the water of the stream be so cleansed by the company, and what expense? Can the plaintiff command a sufficient supply of water by going above the defendants' wells for it, and could they then obtain pure water? If so, what would be the probable cost of such a change in the plant of the water company?

When the case has thus been fully heard on its facts the questions we have suggested can be considered and it will be practicable to say whether a great city stands on no higher ground when the health



and comfort of many thousands of its citizens are at stake than Sanderson when his private water works and fish pond were rendered useless by mine water. Whether in other words the Commonwealth in the exercise of its police power may not limit and restrict the individual in the exercise of admitted rights, when the welfare of the public requires it; or whether it is indeed true that the ownership of a few acres of land, or a leasehold interest therein gives to the holder an unqualified right to destroy the water supply of a city in the effort to develop some subterranean value in his land. If this unqualified right resides in the owner of the land, then it is not easy to see how the water company is in default for failing to do what it is thus determined it has no power to do, viz., to protect the stream from pollution by the land owners within its basin. There would seem upon this view of the law to be no remedy provided for the public or the water company. The latter must lose its plant, its business and for all practical purposes its franchises. The former must suffer the pollution and the actual deprivation of its water supply. The court can require the company to be diligent in its effort to procure for the municipality a sufficient supply of pure water if it can be had from sources reasonably accessible to its plant, and it can restrain the collection of rents if such water is not furnished. It cannot, however, require the company to relocate its plant or to seek a new supply, to reach which would involve an expense greater than its entire capital stock. The location of the plant and the selection of the water supply is for the company to determine. The sufficiency and character of the supply may be investigated by the court and the company required to meet fairly the public use it has undertaken to serve or cease to collect charges therefore. The owner of the oil well, however, is thought to be independent both of the water company whose plant he destroys and of the public whose water supply he pollutes. The mere fact that the plant is owned by a corporation was rigidly held by the court below to furnish no room for a distinction between Sanderson's case and this. Corporations hold their titles, as individuals do, under the Commonwealth, subject to the same incidents as other owners. This is well settled. Among the more recent cases on this subject is the appeal of the Pittsburgh Junction R. R. C., 122 pa. 511. But in all these cases so far as I am familiar with them, the private right of the corporation was invaded. The public interest was not affected and therefore not considered.

The question of the status of the public is now clearly raised. It should be fully considered and decided.

More than one hundred and fifty years ago the necessities of civilized society had led to the general adoption of the definition of liberty which was formulated by Blackstone. It was seen that

civil liberty required that other interests than those of the individual should be reckoned with, and that each person must be held to have surrendered such of his natural rights upon coming into society as could not be asserted consistently with a due respect for the rights of others and for the public good. For myself I can see no reason why our duty towards others ought not to place limits upon our rights of property similar to those which it has put upon our natural rights of person. *Sic utere tuo non alienum leadas* expresses a moral obligation that grows out of the mere fact of membership of civil society. In many instances it has been applied as a measure of civil obligation, enforcable at law among those whose interests are conflicting. Whether it is capable of general application, and whether it is applicable when the interests of the public and those of an individual are irreconcilable, is an open field for inquiry into which this case leads.

The decree is reversed and the record remitted for further proceedings in accordance with this opinion.

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#### OPINION OF THE SUPREME COURT IN THE CASE OF BRYMER ET AL. VS. WATER COMPANY.

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An interesting bit of reading to the people of Butler is the opinion of the Supreme Court in the case of Andrew Brymer et al. vs. The Butler Water Company which was heard in the courts of the county last July and was argued in the Supreme Court in October. The full text of the opinion, which is by Justice Williams, is as follows:

This bill was filed under the provisions of the corporation act of 1874. It alleges the incorporation of the company defendant in pursuance of the provisions of that act as a water company; the fact that it has been engaged in furnishing a supply of water to the borough of Butler for about seventeen years; and that the water furnished during the dry weather of 1893 and 1894 was muddy and unfit for domestic use, and that the water then being furnished was "impure, filthy and absolutely unfit for domestic and other purposes." The answer denies that the waters of the Connoquenessing creek from which the supply for Butler borough has been taken are either muddy or impure as they ought to be allowed to flow but admits that certain persons have for some months been pumping large quantities of salt water from an oil well or wells out upon the surface of the ground which has found its way into the stream

and rendered its waters, especially when the stream is low, impure and unfit for domestic use; and asserts that it has instituted proceedings in equity to restrain such persons from polluting the stream and destroying the water supply. The case was fully heard in the court below. The learned judge had before him in the first place the question of the quantity and quality of the water furnished by the defendant company. If the quantity was found to be inadequate or the quality so poor as to be unfit for use, he was next to consider whether the trouble could be remedied by a reasonable expenditure of money and effort on the part of the company. If he found this fact also in favor of the plaintiffs, it became his duty to make such order as would quicken the diligence of the water company and protect the public served by it. After hearing the evidence, the learned judge found as a fact that except during the very dry weather in the summers of 1893 and 1894, the supply had been reasonably sufficient in quantity and reasonably pure in quality. He found that by a better system of storage the waters of the Connoquenessing could be made to furnish an ample supply, and that by securing the waters of a tributary called Bonny Brook the supply at command would be several times as great as the population of Butler would require. He also found that the water had been for some months so charged with salt and other minerals from the oil wells as to be absolutely unfit for domestic purposes or for steam, and he enjoined the defendant from collecting water rents except for the flushing of closets and sewers, and for fire purposes. He at the same time made a peremptory order on the company requiring it "to secure and provide forthwith a sufficient supply of reasonably pure water to the inhabitants of Butler borough and patrons of the said defendant company." The decree and the findings on which it rests are now assigned as error and it has been necessary for us to examine the evidence at length in order to determine whether it will support the several findings complained of. This examination has satisfied us that with what has been done to reach the waters of the Bonny Brook the supply must be ample, but that the water has been destroyed for domestic and for steam purposes by the owners and lessee of land along the stream in the effort to obtain petroleum oil from an underlying stratum of sand rock known as the "one-hundred-foot sand." We are also satisfied that it will be wholly out of the question for the defendant to obey the order requiring it to furnish pure water to its patrons if the pollution of the stream by the owners and lessees of land in the basin of the Connoquenessing is a subject over which a court of equity has no control. This question is involved in the *Butler Water Company and the Commonwealth of Pennsylvania ex rel. vs. Russell et al.*, which was argued together with this case, and it will be

considered to some extent in the opinion to be filed therein. We shall confine ourselves in this case to the two questions that are peculiar to it. First, Does the evidence justify the injunction against the collection of water rents for domestic and for steam purposes? We think the conclusion reached by the learned judge that the water was utterly unfit for domestic use, that domestic animals would not use it, and that it was so destructive to the pipes in which it was conveyed and to the flues of boilers in which it was converted into steam as to be unsafe for use for steam purposes, has evidence on which it can fairly rest, and that it supports the restraining order. It is inequitable that a corporation chartered to serve a "public use" and actually undertaking to serve the public with one of the necessities of life should be allowed to collect the price of a supply of good water from those to whom it delivers an article that cannot be used, or be made fit for use by any process within their knowledge or reach. The relations between the defendant and its customers rest on contract and if the commodity bargained for is not delivered it is elementary law that the price is not recoverable. Nor was the learned judge mistaken in the measure of the duty imposed by law on the defendant. It is not bound to provide water that is chemically pure, but water that is ordinarily and reasonably pure. The water for the supply of a city must be taken from some lake or stream or water shed that is accessible, that has not been destroyed, and that can furnish a sufficient quantity to meet the demand. After having secured such a source of supply the company is bound to exercise diligence in the effort to preserve it from pollution and to deliver it to the public in no worse condition than that in which it is taken from the source of supply. Practically it is unimportant whether the water becomes unfit for use because of the neglect, or in spite of the vigilance of the company. The question to be considered as between the seller and buyer is, what is the fact? Is the water fit for use? The same question is also to be investigated by the court on behalf of the public. Is the company meeting the objects of its organization and discharging its duty to the State by fairly serving the public use to which it is required to minister? If this question must be answered in the negative, then the remedy is to order the company to render better service, and to suspend its right to collect rents until water is furnished that can be used with reasonable safety to its customers. If it shall be determined that the defendant and the public are alike remediless, and that the pollution of the stream must go on without check or regulation by the courts, just so long as it may suit the land owners to pump salt water into it, the result will be the practical confiscation of the entire

plant of the water company, and of the natural water supply for ten thousand people, for the benefit of a few persons. In this event the company may be compelled by its own business necessity to elect whether it will go out of business or seek some new and independent source of supply. This is a question which, if the necessity arises, the company must settle for itself. The court cannot make the election for it. Whether it shall move some eighteen miles to the Allegheny river, at an expense probably twice as great as the amount of its capital stock, is a question with which the court has absolutely nothing to do. The court may say "The water you furnish is unfit for use. You shall not collect pay for that which has no value." But it cannot point out a possible supply at some other point and say "You must let go your present source of supply and remove to that which we point out." This disposes of the second question raised by this appeal and distinguishes between the discretion conferred upon the court by the act of 1874 and the business discretion of the owners of the plant of the water company. The company may select the source of supply, may determine a system of collection and distribution, a mode of storage and control generally the business details. The court may investigate the efficiency of the system and the quantity and quality of the water furnished and make such order as may be necessary and just for the protection of the public. We cannot resist the impression that the learned judge took a somewhat harsh and uncharitable view of the conduct of the water company. The pressing evil from which the public suffers was the destruction of the water supply by the oil operators. This the defendant could only correct through the action of the court below, which it had invoked and the result of which it must necessarily abide. Its own investment of one hundred thousand dollars, its business, and in a practical sense, its franchises, were all at stake. It had nothing to make but much to lose by temporizing and we can readily understand how without the assistance of the court, the officers of the company might feel that there was nothing they could do to save the public or themselves from heavy loss. Any temporary expedient may well have seemed to them a useless expenditure of money so long as the pumps were pouring out a continuous stream of water loaded with salt and other injurious minerals into the source of supply. But if it be assumed that the officers of the company intended no disrespect or insubordination, but did in good faith all, or more than the court should have required of them, still the fact remains that the water had been polluted and was clearly unfit for use. That they were unable to remedy this condition or to furnish what their patrons had a right to expect and demand. They had no equitable right, therefore, to collect pay for

what they did not and could not supply. So much of the decree as directed the company to furnish reasonably pure water is a mere declaration of the defendants' legal duty; so much of it as enjoins the collection of rents for water that cannot be used is an appropriate method for compelling the discharge of that duty and for the protection of the public meantime. The decree must be affirmed at the costs of the appellant.

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DECISION OF HIS HONOR, JUDGE MORRISON, ON THE COMPULSORY VACCINATION LAW.

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Case of W. F. Sprague vs. J. E. Baldwin and others, school directors and teachers of the school district of Otto township.

The alternative writ in substance commanded the defendants to admit the plaintiff's two children, Waler Sprague and Ernest Sprague, age respectively eight and fourteen years, to the public schools of the school district of Otto township or show cause why they do not do so. The amended writ and answers admit that the plaintiff was a resident taxpayer of said school district, and that his children were excluded from the public schools for the sole reason that neither of them had produced to his proper teacher a certificate signed by a physician, setting forth that he had been successfully vaccinated, or that he had previously had small-pox, as required by section twelve of the act of Assembly, entitled "An act to provide for the more effectual protection of the public health in the several municipalities of this Commonwealth," approved the eighteenth day of June, 1895, P. L. 203. The answer further sets forth that on the 26th day of October, 1896, at a meeting of the school board duly held, a resolution was passed and duly published throughout the said district that before pupils could be admitted to the public schools the provisions of said act must be complied with and that the said plaintiff and his children had due notice of said resolution which is set out at length in the answer.

To this answer the plaintiff demurred and assigned the following causes of demurrer:

1. That the act of June 18th does not include or relate to township school districts.
2. That the act of June 18th, 1895, is unconstitutional.
3. That the act of June 18th, 1895, is unconstitutional in that it offends article three, section three of the Constitution of Pennsylvania.
4. That the act of June 18th is unconstitutional in that it offends article three, section seven of the Constitution of Pennsylvania.

5. That the twelfth section of the act of June 18th, 1895, is unconstitutional in that it offends article three, section three of the Constitution of Pennsylvania.

6. Because the return is in other respects uncertain, informal, insufficient and defective.

Wherefore, for want of sufficient return, the said plaintiff prays that a peremptory mandamus may issue.

Upon a careful reading of the petition, answer and the act of assembly we are of the opinion that the answer is sufficient and that the demurrer cannot be sustained.

The learned counsel for the plaintiff contended very earnestly that the legislative intent, as expressed in the act of 1895, limited its provisions to cities and boroughs, and that the act cannot be enforced in townships and school districts. He also contends that the title of the act, to wit, "Protection of the public health in the several municipalities of the Commonwealth," is not broad enough to cover the legislation in the act which is now sought to be applied to townships. We are not able to agree with this contention. All that we need to decide now is that the title of the act is broad enough to sustain the twelfth section of the act as to schools, public schools in a township. It must be conceded that the act contains some crudities and that the Legislature seems to have overlooked the fact that there is no provision of law for local boards of health in township school districts.

The fact was also overlooked that as a general rule townships have no township treasurers. But we do not see that these defects in the act are, with others that might be noticed, sufficient to show that the Legislature did not intend the provisions of the act to apply to townships.

Casual inspection of the Constitution of Pennsylvania will show that it classifies both townships and school districts as municipalities.

Constitution of Pennsylvania, section eight, article nine, section ten, article nine; section six, article fourteen and section eight, article sixteen.

And our Supreme Court often characterizes townships as municipalities. See *Township vs. Moore*, 68 Pennsylvania, 404; also *Otto Township vs. Wolf*, 106 Pennsylvania, 610, where the Supreme Court designates the township as a municipality.

Section four, act March 20th, 1845, relating to attachments in execution, P. L. 47, was held to apply to school districts in *Buckley vs. Eckert*, 3 Pennsylvania, 368, and to townships in *Slattery vs. Murphy*, 8 Luz. L. Reg. 272.

The act of April 21st, 1858, provides: "All laws requiring munici-

pal corporations to enter bail or file affidavits of defense are hereby repealed, P. L. 9, has been held to include townships."

Any county, city, borough, township, school district, or other municipality, or incorporated district, is the language used in the act of April 20th, 1874, relating to municipal debts, P. L. 1874, page 65.

That whenever heretofore any city, borough, township or other municipality is the language of May 16, 1891, P. L. 65.

The act of April 26, 1893, P. L. 26, provides: "That municipal corporations shall not be required to file affidavits of defence in actions of assumpsit." It cannot be doubted that the legislative intent was to include both township and school districts in this act.

So we cannot escape the conclusion that the title of the act of June 18, 1895, is broad enough to cover legislation for all of the municipal subdivisions of the Commonwealth, down to, and including townships and school districts. Surely the legislative intent was to protect the public health from contagion, epidemics, public funerals of cholera, small-pox, and scarlet fever victims, and for the courts to hold that the legislative intent was to limit this important legislation to cities and boroughs, and to leave these diseases run riot in the townships would be to convict the Legislature of doing a ridiculous thing. It is probable that one-half of the population of the State is outside of the cities and boroughs and therefore in the townships.

How absurd to say that the legislative intent was to protect the citizens of the cities and boroughs and leave those of the townships to be exposed without protection.

We are of the opinion that the act of 1895 warrants the action taken by the defendants in this proceeding and the writ of peremptory mandamus must be refused. We have read an interesting opinion by Judge McPherson in *Nissley vs. Hummelstown borough schools directors*, Fifth district. Reports, page 732. In this case the learned judge upheld the law as to boroughs as a valid police regulation, and as such constitutional. We concur generally in Judge McPherson's conclusions, but referring to the questions stated by him, "if the compulsory education act and the section under consideration are in irreconcilable conflict, the former statute must give way, because it was passed on May 16th, while the public health act was approved on June 18th, and being the later statute, must be enforced. This is perhaps correct, but we remark that our Supreme Court very recently held that where the same Legislature, at about the same time, enact two laws which appear to be in conflict, every presumption is that they were both intended to stand, even though one is a few days later than the other. We incline to the opinion that both of these acts must be sustained by the courts, unless



some constitutional or other controlling legal reason requires that one of them shall give way. But on this question we need express no opinion at present.

Statutes enacted at the same session of the Legislature are within the reason of the rule governing the construction of statutes in pari materia and should if possible receive a construction which will give effect to each. Each is supposed to speak the mind of the same legislature. *White vs. City of Meadville*, 177 Pennsylvania, 643.

We do not think the plaintiff has shown such a clear case as entitles him to the writ of peremptory mandamus, and his demurrer to the answer is overruled and the writ refused, with judgment against him for costs.

T. A. MORRISON, Judge.

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DECISION OF THE SUPREME COURT OF MICHIGAN ON THE  
DUTY OF HEALTH AUTHORITIES TO APPRAISE AND PAY  
FOR EFFECTS DESTROYED BY THEIR ORDERS.

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A servant employed in the Merchants' hotel in the city of Detroit, Michigan, was taken ill June 1st, 1894. Her disease was pronounced measles by a physician. As she failed to improve, the proprietor telephoned the board of health that he feared the case was smallpox. In reply the contagious disease clerk at the health office said that it was all right, only a case of measles, and it would be best to carry out the orders of the physician referred to. June 6th the girl died. An investigation was made by the health board and the case pronounced smallpox. The officers of the board of health immediately took possession of the hotel and placed it in quarantine, confining therein thirteen persons, several of whom were subsequently stricken with smallpox and detained in the hotel and treated by the board of health. The quarantine continued until June 29th, after which the board of health disinfected the premises and destroyed a considerable portion of the furniture which had become infected. They contended that what was thus done by them was necessary in the interest of the public welfare, and that the loss must be borne by the proprietor of the hotel. But the Supreme Court of Michigan takes a different view of it. *Safford vs. board of health of city of Detroit*, decided July 8th, 1896. It says that it thinks that it is within the contemplation of law that, when property is used or destroyed or services rendered under such circumstances as in this case, compensation should follow. It also holds that it is the

duty of the board of health to pass upon the question of the amount of compensation, and where they refuse utterly to award compensation, that a writ of mandamus may be invoked to compel them to do so."

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**OPINION OF HIS HONOR, M. RUSSELL THAYER, PRESIDENT  
JUDGE OF THE COURT OF COMMON PLEAS, PHILADEL-  
PHIA, ON THE LEGAL SCOPE AND SIGNIFICATION OF  
THE PHRASE "PUBLIC STREAMS."**

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"A public stream or river, as distinguished from a private stream, is one in which the public—the people at large—have rights, whether it be a right of navigation or passage, a right of fishery or a right to the use of the water.

"A private stream, on the contrary, is one in which the general public has no rights. If a stream lies wholly within a man's private domain, he may make such use of the water as he will, so long as he does not injure the rights of other private owners. But he cannot unreasonably obstruct the natural flow of the water to the injury of another owner, or pollute the water. If he does, an action at law lies for such an injury by the person injured, and damages are recovered in a private suit commensurate with the injury.

"But for an obstruction or pollution of a public river or stream—that is a stream in which the public has rights—an indictment lies, it being a public offence. Such injuries to the public are classed under the head of nuisances, public nuisances, and for every public nuisance, that is every act injuriously affecting the general public, an indictment is the proper and appropriate remedy. Every stream may be called a public stream in which the general public has rights, whether it be a right of fishery, a right of navigation, or a right to the use of the water for drinking or domestic purposes. The rule of the common law of England, by which rivers wherein the tide does not ebb and flow belong to the owners of the adjoining lands on each side, has never prevailed in Pennsylvania. On the contrary it was decided by the Supreme Court at a very early period that no such rule could be reasonably applied to the rivers of this State, and that accordingly such rivers as the Delaware, the Ohio and the Allegheny, the Susquehanna and the Schuylkill, belong to the Commonwealth and are of course public streams. *Carson vs. Blazer* 1 Binney, 475; *Shrunk vs. the Schuylkill Navigation Company*, 14; *Serg and Rawle*, 71; and other cases, 1 W. and S., 351; 61 Pennsylvania State reports, 21; 21, Smith, 156; 13, Bright, 433. Any persons

upon the bank of a stream have a right to the use of the water for drinking and domestic purposes.

"If a private stream be polluted the remedy is by a private action at the suit of the party injured.

"If a public stream be polluted the remedy is by an indictment of the wrong doer for maintaining a public nuisance.

"It was upon this ground and in pursuance of this rule of law that I convicted the people who polluted the water of the Schuylkill when they were indicted and tried in the quarter sessions for the nuisances they committed."

#### ARGUMENT OF E. R. MAYO, ESQ., ON "WHAT CONSTITUTES MUNICIPALITY."

<p>W. F. Sprague vs. J. E. Baldwin, et al., directors, and Lillian Campbell, et al., teachers.</p>	}	<p>In the Common Pleas of McKean county, No. 161, December term, 1896</p>
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#### Brief and Argument for Respondents.

First. Does the phrase "the several municipalities of this Commonwealth" include townships and school districts? It may be said that if the term includes either townships or school districts the act applies to the case in hand, since both the township of Otto and the school district of Otto township are coterminus in extent of territory. What is a municipality? It is "a municipal district, borough, city or incorporated town or village."—Webster's dictionary.

Both townships and school districts are classed as municipalities in the laws and Constitution of Pennsylvania and the following are some of the acts of Assembly with the interpretation of the courts, in which both townships and school districts are recognized as "municipalities:" Section four, act March 20th, 1845, relating to attachments in execution; Purdon's Dig. of 1872, page 289, P. L. 47.

This is held to apply to school districts in *Buckley vs. Eckert*, 3 Pa., 368, and to townships in *Slattely vs. Murphy*, 8 Luz. L. Reg., 272.

Section eight, act of April 21st, 1858, relating to affidavits of defence, provides "All laws requiring municipal corporations to enter bail or file affidavits of defence \* \* \* are hereby repealed. Purd. Dig. of 1872, page 1165, P. L. 9. This is held to include townships in *Halsey vs. Dennison township*, 2 Luz. L. Obs., 212; *Brightly's Dig.* 1960.

"Any county, city, borough, township, school district, or other municipality or incorporated district," is the language of successive sections in the act of April 20th, 1874, relating to municipal debts, etc. See laws of 1874, page 65.

"That whenever heretofore any city, borough, township, or other municipality" is the language of the act of May 16th, 1891, P. L. page 65. See also act of same May 16th, 1891, P. L. page 69.

Section one, act of April 26th, 1893, Pub. L., page 26, is in these words: "That municipal corporations shall not be required to file affidavits of defence in actions of assumpsit." Can there be any doubt of the legislative intent to include both townships and school districts in this act?

Moreover, the Constitution itself, in plain and unmistakable terms, classifies both township and school districts as "municipalities." Constitution of Pa., section 8 of Art. IX; section 10, Art. IX; section 6, Art. XIV, and section 8, XVI.

#### And in the Court Reports.

In *Rapho and West Hemphill townships vs. Moore*, 68 Pa. 404, townships are characterized as municipalities in seven and eight of the syllabi of the case, and as municipal corporations by the court itself in *Otto township vs. Wolf*, 106 Pa. in the opinion, page 610, this very Otto township is characterized as "municipality."

And there are doubtless many other cases in which townships as well as school districts are characterized as "municipalities."

Upon a fair estimate, one-half the population of the State is in the townships, and outside the boroughs and cities. What should be said of the average intelligence of a Legislature, which should pretend to protect the public health by law, and yet intend to exclude one-half the public from the operation of the statute? Contagion, epidemics, public funerals of cholera, small-pox and scarlet fever defuncts, and public exposure of the diseased may run riot in the townships, so far as this law controls, if the Legislature only intended it to apply to boroughs and cities, having local boards of health.

To state the proposition with its logical sequences is to refute the idea that the Legislature did not intend the act to apply to townships and school districts.

Second: As to the sufficiency of the title and constitutionality of the act. The public, or to put it emphatically, "The public" is that aggregation of human beings, which includes every individual. If one or more be excluded, it is no longer the public.

"The more effectual protection of the public health" is the important part of the title. It is notice that the public health has not heretofore been sufficiently protected. It is notice that there is

something lacking in the laws or customs heretofore prevailing; and each individual, be his or her station high or low, is a constituent and necessary member or part to make up "the public," and the title is notice to him or her, that he must at his peril look into the body of the act to discover what his specific duties are, in order the more effectually to protect the public health. A short title may be sufficient for a long act. For instance, the law this proceeding is under and regulated by is entitled "An Act Relating to Mandamus." (Laws of 1893, page 345). It is an act of some length comprised in thirty-four sections. Parties seeking different rights and acting in different capacities must proceed in different and diverse ways. Yet who shall say that one seeking the benefits of this writ is not in duty bound to look in the body of this act to discover the way he must proceed? Of the act under consideration the title is sufficient notice to each and all. Cooley's Constitutional Limitations, fourth edition, page 175 (star p. 144); same under title of Police Powers, page 279 and note 2; State line and J. R. Co.'s appeal, 77 Pa., 429; Allegheny county home's case, 77 Pa., 77; in the matter of Church street, 54 Pa., 353; Dorsey's appeal, 72 Pa., 192; Blood vs. Merceiot, 53 Pa., 391; Mauch Chunk vs. McGee, 81 Pa., 433; Commonwealth vs. Benefit A., 171 Pa., 465; Nissley vs. Hummelstown borough school district, Fifth district reports, 732. But if portions of the act be unconstitutional for want of notice in the title, only such portions are void. The rest may stand. Dewhurst vs. Allegheny City, 95 Pa., 437; McGee's appeal, 114 Pa., 470. But the twelfth section of the act is the important one in this case, and this is constitutional because it is sufficiently noticed in the title.

Authorities supra.

Moreover: The resolution of October 26th, 1896, by the board of directors of Otto school district, as set out in their answer, and admitted as fact by the demurrer, is a proper exercise of their discretion in matters pertaining to the health of pupils and the public generally, which the courts would not disturb, even without positive statute to support it. Duffield vs. Williamsport school Dis., 162 Pa., 476.

And the State Board of Health required the defendants to enforce the regulation set out in the twelfth section of the act of June 18th, 1895. See act of June 3d, 1885, public laws, page 56, sections five to seven, inclusive.

OPINION OF J. DAVIS BRODHEAD, ESQ., ON THE COURSE  
TO PURSUE TO ABATE A CESSPOOL NUISANCE ON PRI-  
VATE PROPERTY.

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Dr. E. T. Wilhelm, President Board of Health, South Bethlehem,  
Pennsylvania:

Dear Sir: Answering your inquiry of this morning as to what course could be pursued to abate a nuisance caused by a cesspool on private property within the borough, I would respectfully call your attention to the section five of the act of May 11, 1893, as follows.

"The said board of health shall have power as a body or by committee, as well as the health officer, together with his subordinates, assistants, and workmen, under and by order of the said board, to enter at any time upon any premises in the borough upon which there is suspected to be any infectious or contagious disease or nuisance detrimental to the public health for the purpose of examining and abating the same, and all written orders for the removal of nuisances issued to the said health officer by order of said board, attested by the secretary, shall be executed by him and his subordinates and workmen and the cost and expense thereof shall be recoverable from the owner or owners of the premises from which the nuisance shall be removed, or from any person or persons causing or maintaining the same, in the same manner as debts of like amount are now by law collected."

And also to the section one of the borough board of health ordinance, as follows:

"Section 1. That whatever is dangerous to human life or health, whatever renders the air or food or water or other drink unwholesome, and whatever building, erection, or part of cellar thereof, is overcrowded, or not provided with adequate means of egress, or is not sufficiently supported, ventilated, sewered, drained, cleaned or lighted, are declared to be nuisances, and to be illegal; and every person having aided in creating any of them, shall be deemed guilty of a violation of this ordinance, and also to be liable for the expense of the abatement and remedy thereof."

In the case in question I would therefore say that if the offending property owner refuses to voluntarily abate the nuisance, which your board deems detrimental to the public health, your course is to order the health officer to proceed with his workmen and enter upon the premises, disconnect the cesspool from the house, clean

it out, and fill it up, or proceed to otherwise abate the nuisance as your board may order, then bring suit against the property owner to collect from him all costs and expenses incurred.

I am, yours truly,

J. DAVIS BRODHEAD, Attorney.

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## CORRESPONDENCE.

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### NOTICE OF THE ESTABLISHMENT OF A PROVINCIAL BOARD OF HEALTH AT VICTORIA.

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Victoria, B. C., Canada, Nov. 9th, 1895

Dear Sir: I have the honor to inform you that a provincial board of health has recently been formed for British Columbia.

I shall be greatly obliged if you will forward me any information in your possession which would be of service in organizing the board. I should like copies of your health act, by-laws, regulations, reports on vital statistics, and, if available, the annual reports of your board for the past five or more years, also any pamphlets or circulars relating to sanitary matters.

For this and any other information you may be kind enough to send, I shall thank you sincerely.

I am, sir, very truly yours,

A. T. WATT, M. D., Secretary.

To the Secretary of the State Board of Health of Pennsylvania.

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## REGULATIONS OF SCHOOL ROOMS.

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Dr. Benjamin Lee:

Dear Sir: In reply to yours would say that the board of education through its committee on property has adopted as the size of its class rooms a standard of thirty-two by twenty-four and thirteen feet high. Particulars of same you will find in report of Inspector Cassel enclosed herein. Some of the new buildings are not provided with the motive power, but dimensions are the same. All windows are provided with transoms hinged at the

bottom and air can be admitted without exposing the children to drafts. All new buildings are heated by steam by a system of direct and indirect method.

Yours truly,  
PAUL KAVANAUGH,  
Chairman Committee on Property.

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Office of Architect and Supervisor,  
Philadelphia, April 4th, 1896.

Mr. Paul Kavanaugh, Chairman of the Committee on Property:

Dear Sir: In response to your request for information, I respectfully submit the following:

The size of class rooms as constructed for public school purposes are twenty-four by thirty-two by thirteen feet high or nine thousand nine hundred and forty-eight cubic feet.

The allotment is forty pupils for each room, or two hundred and forty-nine and six-tenths cubic feet of space for each pupil; the floor space for each pupil is nineteen and two-tenths square feet.

The heating and ventilating of the rooms is by power fan system, which delivers not less than twelve hundred cubic feet of air per minute to each class room, or thirty cubic feet of air per minute for each pupil.

The air is taken from the outside of the building and blown through a series of steam heated radiators of sufficient capacity to raise the temperature from zero to one hundred and seventy-five degrees Fahrenheit.

The heated air is then conducted by ducts to the various rooms and delivered in same eight feet above the floor level.

The temperature in the class rooms is controlled automatically, by mixing cooler air or cutting it off, as the case may require.

Accelerated exhaust flues are provided with intake openings near the floor line in the inner walls. The combined area of these intake openings is four hundred and eighty square inches, or about double the size of the air delivery opening.

Very respectfully

J. D. CASSELL, Inspector.



## APPENDIX I.

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### ORGANIZATION, BY-LAWS AND REGULATIONS OF THE STATE BOARD OF HEALTH AND VITAL STATISTICS.

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### STATE BOARD OF HEALTH AND VITAL STATISTICS OF THE COMMONWEALTH OF PENNSYLVANIA, 1897.

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#### Officers and Members.

President, Pemberton Dudley, M. D., of Philadelphia.

Secretary, Benjamin Lee, M. D., of Philadelphia.

Members, Pemberton Dudley, M. D., of Philadelphia; John Fulton, C. E., Johnstown; J. H. McClelland, M. D., Pittsburgh; George G. Groff, M. D., Lewisburg; Hon. Samuel T. Davis, M. D., Lancaster; Richard Y. Cook, Esq., Philadelphia; Benjamin Lee, M. D., 1532 Pine street, Philadelphia.

Place of meeting—Office of the Board, State Capitol, Harrisburg (unless otherwise ordered). Janitor—John Harner, 1417 North Third street, Harrisburg.

Time of Meeting—Second Thursday in May, July and November, at 4 p. m.

#### Standing Committees.

I. Executive Committee—Richard Y. Cook, chairman; Pemberton Dudley, M. D., and Benjamin Lee, M. D., secretary. Place of meeting, executive office, 1532 Pine street, Philadelphia. Secretary's address, 1532 Pine street, Philadelphia.

II. Committee on Registration and Vital Statistics—Dr. Benjamin Lee and Dr. Samuel T. Davis. Bureau of Registration of Vital Statistics, Department of Internal Affairs, State Capitol, Harrisburg. State Superintendent of Registration of Vital Statistics, Benjamin Lee, M. D. Registrars of Marriages, Births and Deaths, all clerks of Orphans' Courts. Registrars of Practitioners of Medicine and Surgery all Prothonotaries.

III. Committee on Preventable Diseases, Disinfection and Supervision of Travel and Traffic—George G. Groff, M. D., chairman; Samuel T. Davis, M. D., and John Fulton, C. E.

IV. Committee on Water Supply, Drainage, Sewerage, Topography and Mines—John Fulton, C. E., chairman, and J. H. McClelland, M. D.

V. Committee on Public Institutions and School Hygiene—S. T. Davis, M. D., chairman, and George G. Groff, M. D.

VI. Committee on Adulterations, Poisons, Explosives, and Other Special Sources of Danger to Life and Limb—Pemberton Dudley, M. D., chairman, and Richard Y. Cook.

VII. Committee on Sanitary Legislation, Rules and Regulations—James H. McClelland, M. D., chairman, and Benjamin Lee, M. D.

The President is a member ex-officio of all committees.

#### County Medical Inspectors.

County.	Inspectors.	P. O. Address.
Adams, .....	J. B. Scott, M. D., .....	Gettysburg.
Allegheny .....	S. M. Rhinehart, M. D., .....	Allegheny.
Armstrong, .....	S. A. S. Jessop, M. D., .....	Kittanning.
Beaver, .....	H. S. McConnel, M. D., .....	New Brighton.
Bedford, .....	A. Enfield, M. D., .....	Bedford.
Bucks, .....	A. M. Cooper, M. D., .....	Point Pleasant.
Blair, .....	C. B. Dudley, M. D., .....	Altoona.
Bradford, .....	S. M. Woodburn, M. D., .....	Towanda.
Berks, .....	D. Longaker, M. D., .....	Reading.
Butler, .....	S. Graham, M. D., .....	Butler.
Cambria, .....	W. E. Matthews, M. D., .....	Johnstown.
Cameron, .....	E. O. Bardwell, M. D., .....	Emporium.
Carbon, .....	J. B. Tweedle, M. D., .....	Weatherly.
Centre, .....	G. F. Harris, M. D., .....	Bellefonte.
Chester, .....	I. Massey, M. D., .....	West Chester.
Clarion, .....	H. N. Hess, M. D., .....	Clarion.
Clearfield, .....	S. M. Free, M. D., .....	DuBois.
Clinton, .....	R. B. Watson, M. D., .....	Lock Haven.
Columbia, .....		
Crawford, .....	W. G. Johnston, M. D., .....	Titusville.
Cumberland, .....	R. L. Sibbet, M. D., .....	Carlisle.
Dauphin, .....	P. A. Hartman, M. D., .....	Harrisburg.
Delaware, .....	R. S. Maison, M. D., .....	Chester.
Elk, .....	W. L. Williams, M. D., .....	Ridgway.
Erie, .....	C. B. Kibler, M. D., .....	Corry.
Fayette, .....		
Forest, .....	J. W. Morrow, M. D., .....	Tionesta.
Franklin, .....	P. B. Montgomery, M. D., .....	Chambersburg.
Fulton, .....	A. D. Dalbey, M. D., .....	McConnellsburg.
Greene, .....	J. T. Adams, M. D., .....	Waynesburg.
Huntingdon, .....	A. B. Brumbaugh, M. D., .....	Huntingdon.

County.	Inspectors.	P. O. Address.
Indiana, .....	N. Frank Ehrenfeld, M. D., .....	Indiana.
Jefferson, .....	A. F. Balmer, M. D., .....	Brookville.
Juniata, .....	W. H. Banks, M. D., .....	Mifflintown.
Lackawanna, ...	H. V. Logan, M. D., .....	Scranton.
Lancaster, .....	W. Blackwood, M. D., .....	Lancaster.
Lawrence, .....	.....	.....
Lehigh, .....	M. F. Cawley, M. D., .....	Allentown.
Lebanon, .....	S. P. Heilman, M. D., .....	Heilmandale.
Luzerne, .....	C. P. Knapp, M. D., .....	Wyoming.
Lycoming, .....	A. Richter, M. D., .....	Williamsport.
McKean, .....	B. Chadwick, M. D., .....	Smethport.
Mercer, .....	T. M. Cooley, M. D., .....	Sandy Lake.
Mifflin, .....	A. T. Hamilton, M. D., .....	Lewistown.
Monroe, .....	W. E. Gregory, M. D., .....	Stroudsburg.
Montgomery, ...	H. H. Whitcomb, M. D., .....	Norristown.
Montour, .....	E. A. Curry, M. D., .....	Danville.
Northampton, ...	T. C. Zulick, M. D., .....	Easton.
Northumberland,	A. C. Clark, M. D., .....	Sunbury.
Perry, .....	A. R. Johnston, M. D., .....	New Bloomfield.
Philadelphia, ...	W. B. Atkinson, M. D., .....	Philadelphia.
Pike, .....	E. B. Wenner, M. D., .....	Milford.
Potter, .....	E. H. Ashcraft, M. D., .....	Coudersport.
Schuylkill, .....	A. H. Halberstadt, M. D., .....	Pottsville.
Snyder, .....	F. J. Wagenseller, M. D., .....	Selinsgrove.
Somerset, .....	H. Garey, M. D., .....	Berlin.
Sullivan, .....	W. Waddell, M. D., .....	Dushore.
Tioga, .....	C. S. Logan, M. D., .....	Arnot.
Union, .....	W. Leiser, M. D., .....	Lewisburg.
Washington, ...	C. B. Wood, M. D., .....	Monongahela.
Wayne, .....	H. A. Plum, M. D., .....	Hawley.
Westmoreland, .	R. B. Hammer, M. D., .....	Greensburg.
Wyoming, .....	B. E. Bidleman, M. D., .....	Tunkhannock.
York, .....	I. C. Gable, M. D., .....	York.

#### Engineer Inspectors.

Eastern District—William H. Boardman, C. E., Philadelphia.

Western District—Northern Division, James H. Harlow, C. E., Edgewood.

Western District—Southern Division, Thomas P. Roberts, C. E., Pittsburgh.

#### Bacteriologist.

Professor W. M. L. Coplin, M. D., Jefferson Medical College, Philadelphia.

## Assistant Bacteriologists.

Eastern District—Robert L. Pitfield, M. D., Philadelphia.

Monroe County—Richard Slee, M. D., Swiftwater.

Union County—Nelson F. Davis, Lewisburg.

## Chemists.

Eastern District—Laboratory of Hygiene, University of Pennsylvania, Philadelphia.

Western District—Professor F. C. Phillips, Western University of Pennsylvania, Allegheny.

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 Constitution.

The constitution of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania is the act of Legislature establishing the board, approved June 3, 1885, of which the following is the correct text.

## AN ACT

To establish a State Board of Health for the better protection of life and health, and to prevent the spread of contagious and infectious diseases in this Commonwealth.

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same, That the Governor by and with the advice and consent of the Senate, shall appoint six persons, a majority of whom shall be physicians of good standing, graduates of regularly chartered and legally constituted medical colleges, and of not less than ten years' experience in the practice of their profession, and one of whom shall be a civil engineer, who, together with the secretary, the mode of whose appointment is hereinafter provided for, shall constitute and be designated as the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania. Of the six persons first appointed two shall serve for two years, two for four years and two for six years, from the first day of July next following their confirmation; and the Governor shall thereafter biennially appoint, by and with the advice and consent of the Senate, two persons of the same professions as those whose terms of office have just ex-

Manner of appointment.

Number of members.

Term of service.

pired, to be members of said board, to hold their offices for six years from the first day of July next following their confirmation, and until their successors are appointed, excepting the secretary, who shall continue in office as hereinafter provided; but any member may be reappointed. Any vacancy occurring in said board during a recess of the Legislature shall be filled by the Governor until the next regular session of the same.

Manner of organization.

Section 2. As soon as possible after the appointment of the first six persons as aforesaid, they shall meet in the office of the Secretary of the Commonwealth, and shall proceed, under the direction of the latter officer, to determine, by lot, which of them shall serve for the respective terms of two, four and six years. Before entering upon the duties of the office they shall take the oath prescribed for State officers by the Constitution of the State, and shall file the same in the office of the Secretary of the Commonwealth, who, upon receiving the said oath of office, shall issue to each a certificate of appointment for his respective term of office determined as aforesaid; upon receiving which they shall possess and exercise the powers and perform the duties of said board as defined in this act. Immediately after having taken the oath of office they shall organize by electing one of their number to be president, and by appointing a proper person, who shall be a physician of good standing, of not less than ten years' professional experience, and a graduate of a legally constituted medical college, to be secretary of said board, who shall hold his appointment until removed by the appointment of his successor or otherwise. The board may elect one of its own members secretary, in which case the vacancy thus created shall be filled by the Governor in the same manner as a vacancy caused in any other way. The president shall be elected annually. No member of the board, except the secretary, shall, as such, receive any salary; but the actual traveling and other expenses of any member while engaged on the actual duties of the board, shall be allowed and paid on presentation to, and approval by the Auditor General of an itemized account, with vouchers annexed.

Appointment of secretary.

Actual expenses of members to be paid.

Duties of Secretary.

Section 3. The secretary shall be the executive officer of the board, and shall have all the powers and privileges of a member of said board, except in regard to voting upon matters relating to his own office and

duties as secretary. He shall receive an annual salary of two thousand dollars, which shall be paid him in the same manner that salaries of other State officials are paid; and such necessary expenses as the Auditor General shall audit, on presentation of an itemized account with vouchers annexed and the certificate of the board, shall be allowed him.

Salary of Secretary.

Section 4. The said board shall meet at least once every six months, and may also hold special meetings as frequently as the proper and efficient discharge of its duties shall require, in the Capitol building at Harrisburg (unless otherwise ordered), and the rules and by-laws of the board shall provide for the giving of proper and timely notice of all such meetings to every member of the board. The Secretary of Internal Affairs shall provide and furnish such apartments and stationery as said board may require in the discharge of its duties. A majority of the members of the board shall, at any regular, called or adjourned meeting, organize and constitute a quorum for the transaction of business.

Time and place of meetings.

Section 5. The State Board of Health and Vital Statistics shall have the general supervision of the interests of the health and lives of the citizens of the Commonwealth, and shall especially study its vital statistics. It shall make sanitary investigations and inquiries respecting the causes of disease, and especially of epidemic diseases, including those of domestic animals, the sources of mortality, and the effects of localities, employments, conditions, habits, food, beverages and medicine on the health of the people. It shall also disseminate information upon these and similar subjects among the people. It shall, when required by the Governor or the Legislature, and at such other times as it deems it important, institute sanitary inspections of public institutions or places throughout the State. It shall codify and suggest amendments to the sanitary laws of the Commonwealth and shall have power to enforce such regulations as will tend to limit the progress of epidemic diseases.

Duties and functions of board defined.

Section 6. In cities, boroughs, districts and places having no local boards of health, or in case the sanitary laws or regulations in places where boards of health or health officers exist should be inoperative, the State Board of Health shall have power and au-

Powers of board

thority to order nuisances, or the cause of any special disease or mortality to be abated and removed, and to enforce quarantine regulations as said board shall direct.

Penalty for violation and neglect.

Any person who shall fail to obey, or shall violate, such order shall, on conviction, be sentenced to pay a fine of not more than one hundred dollars at the discretion of the court.

Functions of board in registration.

Section 7. It shall be the duty of the State Board of Health and Vital Statistics to have general supervision of the State system of registration of births, marriages and deaths, of prevalent diseases, and of practitioners of medicine and surgery, to prepare the necessary methods, forms and blanks for obtaining and preserving such records, and to insure the faithful registration of the same in the several counties and in the Central Bureau of Vital Statistics at the Capitol of the State. The said board shall recommend such forms and amendments of laws as shall be deemed to be necessary for the thorough organization and efficiency of the registration of vital statistics throughout the State. The secretary of the State Board of Health and Vital Statistics shall be the superintendent of registration of vital statistics as supervised by said board; the clerical duties and safe keeping of the bureau of vital statistics thus created shall be provided for by the Secretary of Internal Affairs, who shall also provide and furnish such apartments and stationery as said board shall require in the discharge of such duties.

Secretary of Internal Affairs to provide stationery and apartments.

Local boards of health and institutions to report to board.

Section 8. It shall be the duty of all health officers and boards of health in the State to communicate to said State Board of Health copies of all their reports and publications and also such sanitary information as may be requested by said Board. And said Board is authorized to require reports and information (at such times and of such facts, and, generally, of such nature and extent as its by-laws or rules may provide) from all public dispensaries, hospitals, asylums, infirmaries, prisons and schools, and from the managers, principals and officers thereof, and from all other public institutions, their officers and managers, and from the proprietors, managers, lessees and occupants of all places of public resort in the State; but such reports shall only be required concerning matters or particulars in respect of which it may, in

its opinion, need information for the proper discharge of its duties.

Section 9. Said board may, from time to time, engage suitable persons to render sanitary service or to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto. But no more than two thousand dollars shall be expended in any one year for such special sanitary service.

Scientific investigations.

Section 10. It shall be the duty of said board, on or before the first Monday of December, in each year, to make a report in writing to the Governor of this State upon the sanitary condition and the prospects of the State, and such report shall set forth the action of the said board and its officers and agents, and the names thereof, for the past year, and may contain other useful information pertinent to the objects for which it was created, and shall suggest any further legislative action or precaution deemed proper for the better protection of life and health; and the annual report of said board shall also contain a detailed statement of the (State) Treasurer of all moneys paid out by or on account of said board, and a detailed statement of the manner of its expenditures during the year last past, but its total expenditures shall not exceed the sum of five thousand dollars in any one year.

Annual report.

No in P. L., probably a mistake of transcriber.

Section 11. The sum of ten thousand dollars (\$10,000) is hereby appropriated from the Treasury for the purposes of this act and the expenditures properly incurred by the authority of said board and verified by affidavit, subject, however, to the limitations herein before imposed, and shall be paid by the Treasurer upon the warrant of the Auditor General.

Appropriation

Section 12. This act shall take effect immediately, and all acts or parts of acts inconsistent herewith shall be and are hereby repealed.

Approved June 3, 1885.

ROBERT E. PATTISON.



## BY-LAWS.

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The By-Laws of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania are as follows:

### *Article I.*

#### Officers of the Board.

Section 1. The officers of the Board shall be a President and Secretary as directed by section two of the act establishing the Board.

Section 2. All elections shall be by ballot.

### *Article II.*

#### Duties of Officers.

Section 1. The President shall preside at the meetings of the Board, preserve order, and perform such other duties as custom and parliamentary usage require. He shall be, ex-officio, a member of all committees.

Section 2. The Secretary shall keep the records and conduct the correspondence of the Board. He shall be custodian of all books, documents, furniture and other property belonging to the Board. He shall give proper and timely notice, in writing, of every regular and called meeting, to each member of the Board, and shall, as executive officer, perform such other duties as are assigned by the act establishing the Board, or by these by-laws, as the Board may from time to time direct. All communications from the Secretary to the Board shall be in writing.


### *Article III.*

#### Meetings.

Section 1. The regular meetings of the Board shall be held on the second Thursday in May, July and November, at Harrisburg (unless otherwise ordered). At the meeting in July the election of officers shall be held. At the meeting in November the annual report shall be adopted, and at the meeting in May a public address on some sanitary topic shall be delivered.

Section 2. Special meetings shall be called by the President, at such time and place as he shall designate, whenever requested in writing by three members of the Board, one of whom shall be the Secretary.

Section 3. A majority of the members of the Board shall at any regular, called or adjourned meeting, organize and constitute a quorum for the transaction of business.



*Article IV.*

## Order of Business.

Section 1. All meetings of the Board shall be called to order at the appointed hour by the President. In the event of his absence a chairman pro tempore shall be appointed.

Section 2. At regular meetings the business shall be conducted as follows:

1. The Secretary shall register the names of the members present.
2. The minutes of the last regular meeting shall be read.
3. The minutes of special meetings held since the last regular meeting shall be read.
4. Report of the Secretary.
5. Reports of standing committees.
6. Reports of special committees.
7. At the meeting in July, nomination and election of a president for the ensuing year; at the meeting in November, appointment of standing committees.
8. Unfinished business.
9. New business.
10. Adjournment.

Section 3. At special meetings the following shall be the order of business:

1. Registration of names of members present.
2. Reading of minutes, if called for.
3. Presentation of special subject.
4. Presentation of accounts.
5. Adjournment.

*Article V.*

## Annual Report of the Secretary.

The Secretary shall, at the meeting in November, make a full report of his official acts during the year ending October 1, preceding, and accompany the same with recommendation of such measures as he shall deem necessary for the preservation of the public health and the faithful execution of the law, and this report shall constitute the basis of the report of the Board to be presented to the Governor on or before the first Monday of December in each year, in accordance with the requirements of section ten of the act constituting this Board.

*Article VI.*

## Standing Committees.

Section 1. The following standing committees shall be appointed by the President of the Board at the meeting in November:

1. An executive committee.
2. A committee on registration and vital statistics.

3. A committee on preventable diseases, disinfection and supervision of travel and traffic.

4. A committee on water supply, drainage, sewerage, topography and mines.

5. A committee on public institutions and school hygiene.

6. A committee on adulterations, poisons, explosives and other special sources of danger to life and limb.

7. A committee on sanitary legislation, rules and regulations.

Section 2. Such papers, communications, or other matter received by the Secretary as he may deem proper for the purpose, he shall forward to the chairman of the appropriate committee, after filing the titles and memoranda, which shall be recorded in the Secretary's office.

Section 3. All reports of committees shall be in writing.

### *Article VII.*

#### Finances.

Section 1. All accounts against the Board shall be filed with the Secretary, and may be presented at any meeting of the Board, when they shall be acted on in open session; and all accounts allowed shall be endorsed "Approved by order of the State Board of Health and Vital Statistics," and shall be endorsed by the President and Secretary.

Section 2. The Secretary shall record in a book reserved for that purpose, all accounts of expenditures ordered or made by the Board and its several members, and shall, before presenting any bill, account or voucher to the Auditor General, cause a copy of the same to be recorded, and shall have stamped upon such voucher, account or bill the audit and date, as the executive committee shall provide.

### *Article VIII.*

#### Executive Committee.

Section 1. The executive committee shall consist of not less than three members, including the Secretary of the Board, who shall be secretary of the committee.

Section 2. It shall have the general supervision of the finances, purchases, expenses and publications of the Board.

Section 3. Its office shall be in the city of Philadelphia until otherwise ordered.

Section 4. It shall hold meetings at least quarterly, and as much often as it shall deem necessary, and shall meet on the call of the chairman.

Section 5. With the approval of the Board or of the executive committee, the Secretary shall make a requisition upon the Secretary of Internal Affairs for such stationery, printed forms, clerical labor, apartments and furniture as shall be needed for the use of the Board.

Section 6. No purchases shall be made or expenses incurred except by order of the Board or of the executive committee; and the executive committee shall not have power to incur any indebtedness beyond the amount appropriated by law.

*Article IX.*

Rules of Order.

In conducting the business of the meetings of the Board, the parliamentary rules governing the Legislature of the State of Pennsylvania shall be adopted so far as they are applicable to its deliberations.

*Article X.*

Seal.

The seal of the Board shall be circular in shape, bearing on the circumference the words, "State Board of Health. Pennsylvania. 1885. Salus Populi Suprema Lex," and in the centre the coat-of-arms of the Commonwealth.

*Article XI.*

Amendments.

These by-laws may be altered or amended at any regular meeting of the Board by a two-thirds vote of the members present.

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REGULATIONS OF THE BOARD.

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(R. I.)

*Regulation in Regard to the Abatement and Removal of Nuisances.*

Whenever a complaint is made in writing to the Secretary of the Board of the existence of a nuisance, he shall forthwith, as executive officer of the Board, investigate the matter and shall determine whether the alleged nuisance is detrimental to the public health, or the cause of any special disease or mortality; and in case he shall so find, then he shall notify the owner, agent or occupier of said premises, in writing, of such finding, and the executive officer shall thereupon order and direct the abatement and removal of the same within ——— days; and in the event of the failure of said owner, agent or occupier of said property to abate and remove the nuisance, then the executive officer may proceed to abate and remove the same, and may employ all the force necessary to do so, and shall proceed by warrant, arrest and indictment, to convict the party failing to ~~obey said order of~~ abatement and removal.

## (R. II.)

*Provisional Regulations for Preventing House Yards, Streets, Slaughter Houses, Stock Yards, Hog Pens, Bone Boiling and Fat Rendering and Other Similar Establishments From Being or Becoming Prejudicial to the Public Health.*

Nuisances Defined.

1. Whatever is dangerous to human life or health, and whatever renders soil, air, water or food impure or unwholesome, are declared to be nuisances and to be illegal, and every person having aided in creating or contributing to the same, or who may support, continue or retain any of them, shall be deemed guilty of a violation of these regulations.

House Refuse, Garbage, Etc.

2. No house refuse, offal, garbage, dead animals, decaying vegetable matter, or organic waste substance of any kind, shall be thrown upon any street, road, ditch, gutter or public place, and no putrid or decaying animal or vegetable matter shall be kept in any yard, house, cellar or adjoining out-buildings for more than twenty-four hours.

Noxious Trades.

3 No person or company shall erect or maintain any manufactory or place of business dangerous to life or detrimental to health, or where unwholesome, offensive or deleterious odors, gas, smoke, deposit or exhalations are generated, within one mile of the limits of any city or borough, without the permit of the board of health of said city or borough, and all such establishments shall be kept clean and wholesome so as not to be offensive or prejudicial to public health, nor shall any offensive or deleterious waste-substance, refuse or injurious matter be allowed to accumulate upon the premises or be thrown or be allowed to run into any public waters, stream, water course, street, road or public place. And every person or company conducting such manufacture or business shall use the best approved and all reasonable means to prevent the escape of smoke, gases and odors, and to protect the health and safety of all operatives employed therein.

4. The business of bone and horse boiling shall not be allowed, unless conducted under cover, the building to be provided with smoke consumers, and a due regard to be had to cleanliness in the disposition of the offal. No bone boiling establishment or depository of dead animals shall be kept or erected in any part of this Commonwealth which is not under the jurisdiction of the

health, without a permit from the board of health of the nearest city or borough.

5. No permit shall be granted to any person or persons to carry on the business of boiling bones of dead animals until after a careful inspection of the locality, buildings and apparatus, and of the plans for conducting the business, by an accredited inspector of the State Board of Health, or, if such inspector be not accessible, then by an inspector appointed for the purpose by the board of health of the nearest city or borough.

6. No bone-boiling establishments or depositories of dead animals shall be kept or erected in or near a thickly inhabited neighborhood.

7. The floors of all bone-boiling establishments and depositories of dead animals shall be paved with asphalt or with brick or stone, well laid in cement, or with some other impervious material, and shall be well drained. All such establishments shall have such an adequate water supply as will enable thorough cleanliness to be maintained.

8. The boiling of bones and dead animals, etc., shall be conducted in steam-tight kettles, boilers or caldrons, from which the foul vapors shall first be conducted through scrubbers or condensers, and then into the back part of the ash-pit of the furnace fire, to be consumed, or by other apparatus equally efficient in preventing or counteracting the offensive effluvia.

9. When bones are being dried after boiling, they shall be placed in a close chamber, through which shall be passed, by means of pipes, large volumes of fresh air, the outlet pipe terminating in the fire-pit.

10. All proprietors of bone-boiling establishments not having, on the first day of July, 1886, permits to carry on the business, and violating these regulations, shall be liable to prosecution for failing to obey this order and also to an indictment at common law for creating and maintaining a nuisance.

11. The permit clerk of each local board of health shall have provided a book in which to enter the names of all persons engaged in the business of boiling bones and having depositories of dead animals; also, the location of works and appliances as reported by the inspector, whether licensed or not, the number and date of permit, and remarks.

12. No person or persons, without the consent of the board of health of the nearest city or borough, shall build or use any slaughter house within the limits of this Commonwealth; and the keeping and slaughtering of all cattle, sheep and swine, and the preparation and keeping of all meats, fish, birds or other animal food, shall be in the manner best adapted to secure and continue their whole-

someness as food; and every butcher or other person owning, leasing or occupying any place, room or building wherein any cattle, sheep or swine have been or are killed or dressed, and every person being the owner, lessee or occupant of any room or stable wherein any animals are kept, or of any market, public or private, shall cause such place, room or building, stable or market, to be thoroughly cleansed and purified, and all offal, blood, fat, garbage, refuse and unwholesome and offensive matter to be removed therefrom at least once in every twenty-four hours after the use thereof for any of the purposes herein referred to, and shall also at all times keep all wood-work, save floors and counters, in any building, place or premises aforesaid, thoroughly painted or whitewashed; and the floors of such building, place or premises shall be so constructed as to prevent blood or foul liquids or washings from settling in the earth beneath.

13. No blood-pit, dung-pit, offal-pit or privy well shall remain or be constructed within any slaughter house. Any one offending against this rule shall be guilty of creating and maintaining a nuisance prejudicial to the public health, and shall be required to remove the notice within ten days from the date of notice.

14. The owners, agents, or occupiers of all slaughter houses are required, during the months of June, July, August and September, to distribute twice in each week not less than twenty-five pounds of chloride of lime about the premises, and also to remove the contents of any manure-pit or manure pile on the premises once in each week, the said premises and contents of manure-pits being hereby declared to be nuisances prejudicial to the public health, unless subject to frequent disinfection and cleaning as herein indicated.

15. All constables and supervisors are enjoined, and all citizens are respectfully desired, to give information to the State Board of Health of any violation of the health laws, or of the regulations of the board, so that the sanitary measures adopted by the latter to ensure the health of the people may be fully carried out, and all offenders promptly punished.

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NOTE.—Section six of the act of June 3, 1885, confers upon the State Board of Health power and authority to order nuisances to be abated and removed in cities, boroughs, districts and places having no local board of health. Any person violating or failing to obey such order becomes liable, on conviction, to a fine of one hundred dollars.

(R. III.)

*Regulations in Regard to the Sanitary Supervision of Travel and Traffic.*

Upon satisfactory information of the approach to, or transit through the Commonwealth of Pennsylvania, of infected persons or goods, it shall be the duty of the secretary, as executive officer of the board, to cause the same to be stopped at the State line, or, if found

within the limits of the State, to cause such persons or goods to be removed from cars, stages, vessels, boats or other conveyances, and securely isolated and disinfected; and he may, if, in his judgment, the emergency is such to demand it, call a meeting of the committee on travel and traffic, to which his action shall be submitted, with his reasons therefor, in writing. But, in cases coming under the jurisdiction of national or municipal quarantine authorities, he shall co-operate with said authorities in all such action.

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(R. IV.)

REGULATION OF TRAVEL AND TRAFFIC.

*Regulations in Regard to Disinterment and Transportation of Dead Bodies.*

*Disinterment of Bodies.*

Rule I. The removal of any body from its place of original interment is declared to be a nuisance dangerous to the public health, and is prohibited unless the same be done under the direction, and by permission of the State or local board of health.

Rule II. The above rule applies as well to the removal of a body from one grave or vault to another in the same cemetery as to its removal to another burial ground or place.

Rule III. The removal of dead bodies from any burial ground situated within the built-up portion of any city or borough is forbidden between April 1 and October 15.

Rule IV. The disinterment of the body of any person who died of any contagious or infectious disease is strictly prohibited, unless by special authority, and upon such conditions as the State or local board of health may impose.

Rule V. The disinterment of bodies of persons who have died of Asiatic cholera, yellow fever, epidemic cerebro-spinal meningitis or spotted fever, small-pox or varioloid, diphtheria, or membranous croup, relapsing fever, typhus or ship fever, or scarlet fever, is prohibited except by special permission of the State or local board of health; provided, however, that no such permit shall be granted within ten years after the interment of such person.

Rule VI. When a body dead of any of the diseases mentioned in the preceding rule is to be disinterred the following precautions shall be strictly observed: (a) No one shall be present at the disinterment but those necessary to perform the labor and one male relative of the deceased. (b) A hermetically sealed zinc-lined box sufficiently large to contain the box, coffin or casket already in the grave shall be in readiness to receive the latter. (c) When within

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six inches of the top of the receptacle containing the body, the earth shall be saturated with one-fifth per cent. solution (1-500) of the bichloride of mercury. (d) The receptacle containing the remains shall on no account be opened, but shall be at once placed in the box provided as above and hermetically sealed, and said box shall not be opened on arriving at the place of destination.

### *Transportation of Bodies.*

Rule I. The transportation of bodies of persons who shall have died from small-pox, Asiatic cholera, typhus fever, diphtheria or yellow fever is strictly forbidden.

Rule II. From October 15 to April 1, all other dead bodies may be transported without restriction, except those who shall have died of scarlet fever, typhoid fever or measles, which must be enclosed, as prescribed in Rule III.

Rule III. From April 1 to October 15 all dead bodies, when presented for transportation, must be enclosed in air-tight zinc, copper or lead-lined wooden boxes, or in air-tight iron caskets; or if in any other form of coffin, said coffin must be in a hermetically sealed box, enclosed in a manner satisfactory to the local board of health or health officer.

Rule IV. No person or article which has been exposed to the contagion can accompany the body.

Rule V. Every dead body must be accompanied by a physician's certificate of death, and a certificate from the shipping undertaker that the body has been prepared for transportation in accordance with the rules of the State Board of Health of the Commonwealth of Pennsylvania.

Rule VI. In receiving any dead body which has been shipped from beyond or within the States of New York, New Jersey, Delaware, Maryland, West Virginia or Ohio, or the Province of Ontario, the rules of the State or provincial boards of health of the same must be respected, and their transit permits will be honored without subjecting the body to delay, providing such rules do not conflict with any of the preceding rules in these regulations.

Rule VII. The following shall be the form of a transit permit for the transportation of a dead body within, into, or out of the limits of the Commonwealth of Pennsylvania.

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NOTE.—The rules and regulations of the State Board of Health are laws to be obeyed by every individual in the State.

**Coupon No. 1, to Transit Permit of** .....  
 (Name) .....  
 Before this body leaves .....  
 the Carrier or Trans-  
 portation Agent will tear off and keep this Coupon. If  
 detached from the permit the Coupon must not be re-  
 ceived. (See back of Permit.)

**Coupon No. 2, to Transit Permit of** .....  
 (Name) .....  
 Before this body leaves .....  
 the Carrier or Trans-  
 portation Agent will tear off this Coupon. If otherwise  
 detached from the permit the Coupon must not be re-  
 ceived. (See back of Permit.)

FORM 7

**Commonwealth of Pennsylvania.**  
 [To be issued by any State or Local Health Official.]

**TRANSIT PERMIT.** [For Public Carriers.]

Office of ..... County

R. R. Agents and  
all other carriers or  
back of Permit

Permission is hereby given to remove the remains of .....  
 aged ..... who died at .....  
 on the ..... day of ..... by the cause of death being .....  
 and a Transit Permit being asked for burial at .....  
 in the State of .....  
 Signed by, .....  
 Name of Undertaker or person  
in charge of the Transit. ....  
 (Official title) .....  
 P. O. address, .....

THIS PERMIT MUST IN ALL CASES ACCOMPANY  
THE BODY TO ITS DESTINATION.

## TRANSIT.

[It is to be retained by official issuing Permit.]

## TRANSIT PERMIT.

1. Issued to, .....
2. Name of Deceased .....  
 (If a minor, give parents' names)
3. Interment at, .....
4. Date of Death, ..... Age, .....
5. Place of Death, .....
6. Cause of Death, .....
7. Certified by, ..... M. D.

## TRANSIT PERMIT.

Issued at ..... Co., .....  
 Issued by, .....  
 To whom issued, .....  
 Name of Deceased, .....  
 Date of Death, .....  
 Name of person or Carrier in charge, .....  
 Date of Transit, .....

## (BACK OF ABOVE PERMIT.)

By Railroad and Steamboat Agents, Ferry-Masters and all Carriers that convey the remains over the limits of the county where the death occurred will retain one of the Coupons hereto attached, and deliver the body only to the persons holding this permit. The name of the deceased must appear on the Coupons, which will be returnable to the city or place through or out of which the body is first conveyed, or to such authority as may be directed by the person who issued the Permit.

The 1st Coupon should be taken by the carrier who transports the body from the county where the death occurred; and the 2d should be taken by Carrier or Agent of Transportation upon the route beyond said county, and it may be so taken at either terminus of the distance over which the second stage of transportation extends, as the local sanitary regulations may require; but whoever detaches and takes said 2d Coupon must write across the back of the Permit, as well as upon the 2d Coupon itself in the space at the left of these directions, as follows:

2d Coupon taken at, ..... by, .....  
 Such an endorsement will answer instead of further coupons wherever the body is conveyed; and the Permit is to be surrendered at the place of burial. It, as well as every Coupon, should be preserved.

2d Coupon taken at, .....  
 by, .....

SECOND } taken at, .....  
 COUPON. } by, .....

## FIRST COUPON.

(R. V.)

*Regulation in Regard to the Inter-State Notification of the Existence of Infectious and Contagious Diseases.*

The following are the resolutions adopted by the International Conference of Boards of Health, at Toronto, October 6, 1886, with slight verbal modifications:

Whereas, It is necessary for the protection and preservation of the public health that prompt information should be given of the existence of cholera, yellow fever or small-pox; be it Resolved—

1. That it is the sense of the National Conference of State Boards of Health, that it is the duty of each state and provincial board of health within whose jurisdiction any of said diseases may occur to furnish immediate information of the existence of such disease to boards of health of neighboring states and provinces, and to local boards in such states as have no central board, in which the duty of notification shall lie upon the local boards.

2. That upon the prevalence of rumor of the existence of pestilential disease in any State or province, if positive definite information thereon be not obtainable from the proper health authorities, this conference holds that the health officials of another state are justified in entering the before-mentioned state or province for the purpose of investigating and establishing the truth or falsity of such reports.

3. That whenever practicable, the investigations undertaken under the preceding section shall be made with the co-operation of the state or local health authorities.

4. That any case which presents symptoms leading to serious suspicion of the existence of one of the aforementioned diseases shall be treated as suspicious, and reported as provided for in cases in which the diagnosis is certain.

5. That any case respecting which reputable and experienced physicians disagree as to whether the disease is or is not pestilential, shall be reported as suspicious.

6. That any suspected case respecting which efforts are made to conceal its existence, full history and true nature, shall be deemed suspicious and so reported.

7. That in accordance with the provisions of the foregoing resolutions, the boards of health of the United States and Canada represented at this conference, do pledge themselves to an interchange of information as herein provided.

*Addendum to regulation in regard to the inter-state notification of contagious and infectious diseases*, adopted by the National Conference of State Boards of Health at Washington, September 8, 1887, and by the State Board of Health of Pennsylvania, November 9, 1887.

1. All communicable diseases hereinafter mentioned, prevalent in certain areas, or which tend to spread along certain lines of travel

shall be reported to all state and provincial boards of health within said areas or along said lines of communication.

2. In the instance of small-pox, cholera, yellow fever and typhus, reports shall be at once forwarded, either by mail or telegraph, as the urgency of the case may demand.

3. In the instance of diphtheria, scarlet fever, typhoid fever, anthrax or glanders, weekly reports, when possible, shall be supplied in which shall be indicated as far as known the places implicated and the degree of prevalence.

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(R. VI.)

*Regulation for the Better Preservation of the Public Health, and to Limit the Progress of Epidemic (Contagious and Infectious) Diseases.*

In virtue of the powers conferred by the act of Assembly, of June 3, 1885, section five and six, P. L. 56 of the Laws of the Commonwealth of Pennsylvania, be it ordered by the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, and it is hereby ordered by the authority of the same:

Section 1. That whatever is dangerous to human life or health, whatever renders the air or food or water or other drink unwholesome, and whatever building erection or part of cellar thereof is overcrowded, or not provided with adequate means of ingress and egress or is not sufficiently supported, ventilated, sewerred, drained, cleaned or lighted; are declared to be nuisances, and to be illegal; and every person having aided in creating or contributing to the same, or who may support, continue or retain any of them shall be deemed guilty of a violation of this regulation, and shall be liable to a penalty of not more than one hundred dollars.

Nuisances defined.

Sec. 2. No house refuse, offal, garbage, dead animals, decaying vegetable matter or organic waste substance of any kind shall be thrown on any street, road, ditch, gutter or public place, and no putrid or decaying animal or vegetable matter shall be kept in any yard, house, cellar or adjoining out building or grounds for more than twenty-four hours.

House refuse, garbage, etc. not to be exposed.

Sec. 3. No pig pen shall be built or maintained within one hundred feet of any well or spring of water used for drinking purposes, or within thirty feet of any

Pig pens to be properly constructed and kept clean

street or any inhabited house, or unless constructed in the following manner, viz: So that the floor or floors of the same shall be not less than two feet from the ground, in order that the filth accumulating under the same may be easily removed.

Privies not to remain near wells of drinking water.

Sec. 4. No privy vault, cess-pool, or reservoir into which a privy water-closet, cess-pool, stable or sink is drained, unless it is water tight, shall be constructed, dug or permitted to remain within one hundred and fifty feet of any well, spring or other source of water used for drinking or culinary purposes; unless the surface of such vault, cess-pool or reservoir is at a lower level than the bottom of such well. Earth privies and earth closets, with no vault, pit or depression below the surface of the ground, shall be excepted from this regulation, but sufficient dry earth or coal ashes must be used to absorb all the fluid part of the deposit.

Sec. 5. All sewer drains shall be water tight.

Sewer-drains not to contaminate water supply.

Sec. 6. No sewer drain shall empty into any lake, pond, dam, reservoir, or other collection of water used for drinking purposes, or into any standing water.

Sec. 7. All pipes connecting a water closet with a soil pipe shall be trapped, each separately. All waste pipes shall be trapped, each separately, and close to the connections with each bath, sink, bowl or other fixture, unless adequate provision is made for downward ventilation through said water-pipes, in which case one trap may serve for several fixtures.

Sec. 8. All soil pipes shall be carried at their full size through the roof and left open. A provision shall also be made for admitting air to the house-drain side of the main trap, if such trap exists.

Sec. 9. The joints in vitrified pipes shall be carefully cemented under and around the pipe, and the joints in cast iron pipes shall be run and calked with lead.

Sec. 10. All changes in direction shall be made with curved pipes. All joints and pipes shall be made airtight.

Diseases dangerous to public health enumerated.

Sec. 11. The following named diseases are declared to be communicable and dangerous to the public health viz: Small-pox (variola, varioloid), cholera (Asiatic or epidemic), scarlet fever (scarlatina, scarlet rash,) measles, diphtheria (diphtheritic croup, diphtheric sore throat), typhoid fever, typhus fever, yellow fever, spotted fever (cerebro-spinal meningitis), re-

lapsing fever, epidemic dysentery, hydrophobia, (rabies), glanders (farcy), tuberculosis (consumption), and leprosy, and shall be understood to be included in the following regulations, unless certain of them only are specified.

Sec. 12. Whenever any householder knows that any person within his family or household has a communicable disease, dangerous to the public health, he shall immediately report the same to the school board, giving the street and number, or location of the house.

Householders required to report.

Sec. 13. Whenever any physician finds any person whom he is called upon to visit has a communicable disease, dangerous to the public health, he or she shall immediately report the same to the school board giving the street and number or location of the house, on the receipt of which report the said board shall immediately notify the teacher or principal of every school in the district, instructing said teachers or principals to dispense with the attendance of all pupils residing in the family in which such disease exists. No physician who may, in good faith in obedience to this regulation, report a case as one of communicable diseases which subsequently proves not to be such, shall be liable to a suit for damages for such error in reporting. It shall be the duty of such physician and of all other attendants upon persons affected with such diseases to avoid exposure to the public of any garments or clothing about their own persons that may have been subjected to the risk of infection.

Physicians required to report.

School teachers to be notified.

Physicians not to be sued for mistakes in obeying this regulation.

Sec. 14. No person shall, unless by permit of a board of health, carry or remove from one building to another any patient affected with any communicable disease, dangerous to the public health. Nor shall any person, by any exposure of any individual so affected, or of the body of such individual, or of any article capable of conveying contagion or infection, or by any negligent act connected with the care or custody thereof, or by a needless exposure of himself or herself, cause or contribute to the spread of disease from any such individual or dead body.

Exposure of infected persons or things forbidden.

Sec. 15. There shall not be a public or church funeral of any person who has died of Asiatic cholera, small-pox, typhus fever, diphtheria, yellow fever, scarlet fever or measles, and the family of the deceased shall in all such cases limit the attendance to as few as possible, and take all precautions possible to prevent the

Funeral after infectious diseases forbidden.

Public notice of cause of death required.

exposure of other persons to contagion or infection; and the person authorizing the public notice of death of such person shall have the name of the disease which caused the death appear in such public notice.

Public conveyances not to be infected.

Sec. 16. No person suffering from or having very recently recovered from, small-pox, scarlet fever, diphtheria, yellow fever or measles shall expose himself, nor shall any one expose a person under his charge in a similar condition, in any public conveyance, without having previously notified the owner or person in charge of such conveyance of the fact of such condition as above stated. And the owner or person in charge of such conveyance must not, after the entry of any person so infected into his conveyance, allow any other person to enter it without having sufficiently disinfected it.

Infected conveyances not to be used until disinfected.

Infected houses or rooms not to be let.

Sec. 17. No person shall let or hire any house or room in a house in which a communicable disease, dangerous to the public health, has recently existed, until the room or house and premises therewith connected have been disinfected and for the purpose of this section, the keeper of a hotel, inn or other house for the reception of lodgers, shall be deemed to let or hire part of a house to any person admitted as a guest into such hotel, inn or house.

Isolation of families required.

Sec. 18. Members of any household in which small-pox, diphtheria, scarlet fever or measles exist shall abstain from attending places of public amusement, worship or education, and, as far as possible, from visiting other private houses.

Disinfection required.

Sec. 19. The clothing, bed-clothing and bedding of persons who have been sick with any communicable disease, dangerous to the public health, and the rooms which they have occupied during such sickness, together with their furniture, shall be disinfected as directed in the circulars of this Board.

Infected animals to be excluded.

Sec. 20. No animal affected with a communicable disease, dangerous to the public health, shall be brought within the limits of this Commonwealth, and the bodies of such animals dead of such disease or killed on account thereof, shall be buried with quicklime under four feet of earth or burned, but shall not be buried within five hundred feet of any residence, or of any source of water supply.

Milk not to be adulterated.

Sec. 21. No milk which has been watered, adulterated, reduced or changed in any respect ~~from its natural state~~

ural condition by the addition of any foreign substance, shall be held, kept or offered for sale.

Sec. 22. No meat, fish, birds, fowls, fruit, vegetables, milk, and nothing for human food, not being then healthy, fresh, sound, wholesome, fit and safe for such use, nor, any animal or fish that died by disease, and no carcass of any calf, pig, or lamb, which at the time of its death was less than three weeks old, and no meat therefrom shall be brought within the limits of this Commonwealth or offered or held for sale as food.

No unwholesome food to be sold.

Sec. 23. It shall be the duty of the occupant of every house, in the month of May, in each and every year, to clean the cellars thereof of all dirt, vegetables and other impure matter calculated to engender disease, and to cause them to be thoroughly whitewashed with fresh lime.

Cellars to be cleaned.

Sec. 24. No pupil shall be allowed to attend the public schools in this Commonwealth who has not been vaccinated successfully within seven years.

Vaccination of school children required.

Sec. 25. No parent, guardian or master, in whose house or family there shall have been a communicable disease, dangerous to the public health, shall permit any child residing in said house or family to attend any public, private or Sunday school, after the cessation of said disease, within a period of ten days after the house shall have been thoroughly disinfected and cleaned. And it shall be the duty of school boards to have this section printed on cards, mentioning the names of diseases declared communicable and dangerous to the public health in section thirty-one of this regulation, and posted in every school room, and it shall be the duty of each teacher to read the section to the school at least once a month and whenever any epidemic shall appear.

Period of isolation established for school children.

Children to be instructed in regard to danger of infection.

Sec. 26. Every person who acts as a sexton or undertaker, or cemetery keeper, or has the charge of any tomb, vault, burying ground or other place for the reception of the dead, or where the bodies of any human beings are deposited, shall so conduct his business and so care for any such place above named, as to avoid detriment or danger to public health; and every person undertaking preparations for the burial of a body dead from communicable diseases as hereinbefore enumerated, shall adopt the precautions prescribed in regulation IV of this Board. No dead body shall be exhumed and removed between the months of

Sextons, cemetery keepers, etc.



May and October inclusive and nobody dead from any contagious or infectious disease shall be exhumed and removed unless by special authority and upon such conditions as the State Board of Health may impose.

Penalties to be inflicted.

Sec. 27. Every person violating any section of this regulation is liable for every such offense, upon conviction before any court, to a fine of not more than one hundred dollars, at the discretion of the court.

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(R. VII.)

*Regulation for the Prevention of Blindness.*

Whenever, in any city, borough, village or place in this State having no health authority of its own, any nurse, midwife or other person, not a legally qualified practitioner of medicine, shall notice inflammation of the eyes or redness of the lids in a new-born child under his or her care, it shall be the duty of such person to report the same to some legally qualified practitioner of medicine, within twelve hours of the time the disease is first noticed.

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(R. VIII.)

*Regulation for the Enforcement of Domiciliary Quarantine and Closure of Schools.*

Whenever the Secretary shall have satisfactory information that any of the following diseases, viz: small-pox, varioloid, scarlet fever, diphtheria, yellow fever, typhus fever or Asiatic cholera is epidemic, or threatens to become epidemic in any city, borough, district or place having no local board of health, or in which the sanitary laws or regulations are inoperative, he shall have authority, as executive officer of the Board, to issue a proclamation in the name of the Board declaring such disease epidemic, and to order and enforce such measures in the way of quarantine, isolation of the sick, vaccination, disinfection and the closure of schools, public and private, religious and secular, as in his judgment may be necessary to stamp out the infection.

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(R. IX.)

*Regulation Authorizing the Secretary to Place, or Cause to be Placed, Placards Upon Houses in Which Certain Communicable Diseases Exist.*

Section 1. Whenever the Secretary shall have satisfactory information that any of the following diseases: cholera, small-pox (variola or varioloid), scarlet fever (scarlatina), typhus fever, yellow fever, re

lapsing fever, diphtheria (diphtheritic croup) membranous croup or leprosy exists in any city, borough, district or place having no local board of health, or in which the sanitary laws or regulation are inoperative, he shall have authority to place or cause to be placed, in a conspicuous place or places upon or near the house or premises in which said case may be located a placard or placards upon which shall be printed in large letters the name of the disease from which the person or persons in said house or premises may be suffering, as aforesaid, as the case may be: Provided, That variola or varioloid shall be placarded as small-pox, and that diphtheritic croup and membranous croup shall be placarded as diphtheria, and that scarlatina shall be placarded as scarlet fever, and said placard or placards shall remain thereon until such time as the rules and regulations established by this Board regarding the destruction or disinfection of infected bedding, clothing or other articles which have been exposed to infection, and the disinfection of houses and premises have been fully complied with: Provided, That, in addition to the placarding aforesaid, or in lieu of the same, the Secretary may place or cause to be placed a guard or guards upon said house or premises.

Sec. 2. The head of the family occupying any house or premises upon or near which said placard or placards aforesaid may be placed, shall, upon conviction before any mayor, burgess, alderman, police magistrate or justice of the peace of the city, borough or township in which said offense was committed be liable for the fine or penalty provided by the act of Assembly of June 18, 1895, in any case where such placard or placards are removed, disturbed, covered up, taken down or destroyed with his or her knowledge or consent before the time provided by section one of this regulation; said fine to be not less than five nor more than one hundred dollars in default of payment whereof such person or persons so convicted shall undergo an imprisonment in the jail of the proper county for a period not exceeding sixty days.

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(R. X.)

*Regulation Requiring Burials to be at a Certain Depth Below the Surface of the Ground.*

Section 1. The burial of a body at an insufficient depth below the surface of the ground is hereby declared to be a nuisance prejudicial to the public health.

Sec. 2. In all cities, boroughs, districts and places having no local board of health, no body shall be buried at a less depth than six feet below the surface of the ground in populous districts, or less than four feet below the surface of the ground in rural districts.

## (R. XI.)

*Regulation for the Disinfection of the Persons, Excreta, Effects and Dwellings of those Sick with Communicable (Contagious and Infectious) Diseases.*

## To Disinfect in the Sick-room.

1. All glasses, cups or other vessels used by the patient shall be cleansed in boiling water before being used by others. And all foods and drinks touched and not consumed by the sick shall be burned or buried.

2. The discharge from the bowels and from the kidneys shall be received on their very issue from the body into vessels charged with disinfectants, and, after thorough disinfection, emptied into a closet connecting with a sewer or, in the country, buried at least one hundred feet from any well or running stream. In no case shall they be thrown on the surface of the ground or into a running stream of water. Rags and paper which have become contaminated with any discharge shall be burned at once in a strong fire. It is well, in all contagious diseases, to place a piece of rubber cloth under the patient to prevent the discharges from soaking into the bed.

3. All articles of the patient's clothing, all sheets, towels, napkins, bandages or sponges used about the sick, must, before being taken from the sick room, be thrown into a tub containing several gallons of solution of chloride of lime (standard solution No. 1), and remain in it three hours. Never carry any dry clothes from the sick room without disinfection. After disinfection they must be thoroughly boiled.

5. After death the body must at once be wrapped in a sheet saturated with a solution of corrosive sublimate (standard solution No. 2) and buried as soon as possible.

6. Burn as many of the articles which have been about the sick as possible.

7. Standard Disinfecting Solution, Recommended by the State Board of Health.

1. Standard Solution No. 1.—Dissolve chloride of lime or bleaching powder of the best quality (containing at least twenty-five per cent. of available chlorine) in soft water in the proportion of four ounces (a quarter of a pint) to the gallon.

\*2. Standard Solution No. 2.—Dissolve corrosive sublimate and permanganate of potash in soft water in the proportion of two drachms (a heaping teaspoonful) of each to the gallon.

3. Standard Solution No. 3.—To one part of hypochlorite of soda add five parts of soft water.

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\*NOTE.—This solution is highly poisonous. 2. It requires a contact of one hour to be efficient. 3. destroys lead pipes. 4. It is without odor.

Corrosive sublimate solution should be kept in wooden or crockery vessels.

4. Standard Solution No. 4.—Dissolve corrosive sublimate in water in the proportion of four ounces to the gallon. One fluid ounce (two tablespoonsful) of this solution to the gallon of water is sufficiently strong. Articles should be left in it for two hours. One gallon of standard solution No. 1, may also be mixed with nine gallons of water, and used in the same way. No article should be allowed to leave the infected room until it has been either disinfected or boiled.

#### 8. To Disinfect Discharges from the Patient.

Use standard solutions, Nos. 1, 2 or 3, keeping a pint of the solution used constantly in the vessel ready for any emergency. Let the discharge be passed directly into the solution, then let a pint more of it be added, and let the whole stand sometime to be thoroughly acted upon before being thrown into the sewer or being buried. Ordinary whitewash, freshly made or preserved by pouring a thin film of coal oil on its surface, is also very useful for this purpose. These discharges should never be thrown into a privy or cess-pool, nor into a running stream, nor on the surface of the ground.

#### 9. To Disinfect Clothing, Towels, Napkins, Bedding and Such Textile Fabrics as can be Washed.

Burn as much as possible. Use standard solution No. 4, one ounce to the gallon of water, or use one gallon of solution No. 1 in nine gallons of water. Let the goods soak in the solution for at least three hours before they leave the room. Stir them up so that the solution may get all through the goods. After disinfection boil the goods thoroughly.

#### 10. To Disinfect Water Closets, Urinals, Sinks and Cess-Pools.

5. Carbolic Acid Solution.—Mix one pint of carbolic acid with two and a-half gallons of water.

Standard Solution No. 4, diluted with three parts of water, may also be used in the proportion of one gallon (of the solution) to every four (estimated) of the contents of the vault. Standard solution No. 1 would require to be used gallon for gallon of the material to be disinfected. Dry chloride of lime may be sprinkled over the contents of a privy, or standard solution No. 2 may be made up by the barrel, and four or five gallons be applied during an epidemic.

#### To Disinfect the Room After Death or Recovery.

The room must be vacated. The paper should be carefully scraped from the walls. Thorough ventilation for several days, and thorough washing of all surfaces with one of the disinfecting solutions, say, one pint of standard solution No. 4 to four gallons of water, or a quarter of a pint of solution of hypochlorite of soda to a gallon of

water must be effected. The walls and ceiling, if plastered, should be washed with this solution and then whitewashed. All dust must be carefully washed (not brushed or swept) away from ledges, cracks, corners and crevices.

#### Sulphur Fumigation.

To use this effectively, two pounds of sulphur should be burned in a room ten feet square. Every opening in the room—flues, doors, windows, cracks and crevices—must be closed, except the door by which the disinfectant is to escape; closet doors and bureau drawers should be opened wide, and all woolen articles which have been in the room during the sickness hung on lines, being spread out and opened up as much as possible. The sulphur is to be burned in an iron kettle or other vessel set in a tub containing a little water to guard against fire. A small quantity of water should be evaporated at the same time. A little alcohol or kerosene must be poured upon the sulphur, by means of which it may be ignited. Leave the room quickly, for the fumes are highly poisonous when breathed, and close the door tightly. Let the room remain closed twenty-four hours or more. Then air thoroughly for at least twenty hours.

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#### (R. XII.)

#### *Regulation for the Control and Management of Piggeries in the State of Pennsylvania.*

1. This Board declares the keeping of pigs an offensive industry.
2. Hog yards and piggeries will not be permitted within 200 feet of any natural stream or water-course, and the drainage of a piggery shall in no case be permitted to reach any natural stream until said drainage has been purified.
3. All pig pens shall be constructed with water-tight floors, either of plank or cement, which must be elevated at least ten inches above the ground.
4. The feeding of animals dead from natural causes to pigs will not be allowed. Offal should not be fed to pigs for at least a month before they are killed. The animals to be killed should be removed from the pen where offal is fed and should be fattened on grain. Offal from hogs should not be fed to hogs, as disease is liable to be communicated to sound animals in this way. Offal from hogs must be burned or buried.
5. All pig-pens must be daily cleansed and thus kept free from all offensive odors.

6. Where offal from slaughter-houses is fed to pigs, the yards should be cleaned at least twice each week, the refuse being buried or burned.

7. Where garbage or offal is fed to pigs, the troughs, basins or boxes should be cleansed and dried as often as is necessary to prevent unwholesome odors from arising.

8. No hog-ranch or piggery for garbage or offal feeding, where more than fifty head of swine are kept, shall be established or maintained without a permit from a health authority.

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(R. XVI.)

*Regulation Forbidding the Dumping of Night-Soil in Public Waters.*

The dumping of night soil in any river, stream, lake, pond or other public water in this Commonwealth constitutes a nuisance prejudicial to the public health and is hereby forbidden.

## APPENDIX K.

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### CIRCULARS AND FORMS.

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1. Form of Information as to Laws passed by the Legislature.
2. Form of Tabular Abstract for local boards.
3. Form of Register of Undertakers.
4. Form of Register of Midwives and Professional Nurses.
5. Form of Register of Plumbers.
6. Form of Register of Vaccination.
7. Form of physician's certificate of disinfection.
8. Form of physician's certificate of vaccination.
9. Form of physician's certificate to school teachers of safety of return to school from infected premises.
10. Health officer's notification to prevent blindness.
11. For bacteriological diagnosis.
12. Reply for request for analysis of water.
13. Instruction for taking samples of water.
14. For permission to remove dead bodies.
15. For information in reference to the effects of the water supplies of discharge of tanneries.
16. Monthly report of boards of health.
17. Urging the formation of Associated Boards of Health in counties.

Form of Information as to Laws Passed by the Legislature.

Commonwealth of Pennsylvania.

State Board of Health.

To Boards of Health in Pennsylvania:

It is the duty of the State Board of Health to call the attention of your honorable bodies to the following important laws, passed by the last Legislature, which greatly enlarge the powers of boards of health, and at the same time impose new duties upon them. They are:

Act No. 107, entitled "An act to provide for the better protection of life and health by diminishing the danger from infectious and contagious diseases through the creation of a State Board of Undertakers in the cities of the first, second and third classes, with systematic examinations, registration and licenses for all entering the business of burying the dead, and penalties for violations of the provisions thereof."

Act No. 124, entitled "An act to provide for the more effectual protection of the public health in the several municipalities of the Commonwealth."

Act No. 123, entitled "An act authorizing the boards of health in the cities and boroughs of this Commonwealth to regulate house drainage, the registration of journeyman and master plumbers, and the construction of cess-pools; and

Act No. 263, entitled "An act for the prevention of blindness, imposing a duty upon all mid-wives, nurses or other persons having the care of infants, and also upon the health officer, and fixing a penalty for neglect thereof."

Of these acts, No. 124 is the most important, since it enables boards of health to act by direct authority of the State in all matters pertaining to the control of communicable (contagious and infectious) diseases, instead of being compelled, as heretofore, to await the tardy and often inadequate confirmation of their regulations by councils. The State Board of Health considers it of so much importance that it has issued it as a circular under the title of "The Pennsylvania State Code for the Restriction of Communicable Diseases," and has distributed it to local boards throughout the State. Any board desiring additional copies can obtain them on application to the Secretary. This law makes obligatory on boards certain measures which were before left to their option, or that of councils. These are:

The requiring of reports of contagious diseases from physicians, and the providing of blanks therefor:

The requiring of health certificates for the admission of children to school after having suffered from contagious diseases or having



been exposed to the infection of the same, and the providing of blanks therefor:

The requiring of certificates of vaccinating for the admission of children to school, and the providing of blanks therefor. The responsibility for the enforcement of this last regulation devolves primarily upon the school boards, but it is the duty of boards of health to see that it is complied with.

It will be noticed that this law is equally binding upon boards of health as upon physicians or other persons named in the act, and that neglect to fulfill the duties assigned to them under it will render them liable to its penalties.

Act No. 107, establishing a State Board of Undertakers, unfortunately controls the exercise of this important calling in cities only. It requires undertakers to register with the boards of health, and makes it necessary for the boards to provide books of registry for this purpose.

Act No. 133, requires the registration with the boards of health of all plumbers in cities and boroughs having a system of water-supply, a system of sewerage, or both, and makes it necessary for the boards of health to provide books of registry therefor.

Act No. 263, makes it the duty of all mid-wives and nurses discovering indications of inflammation of the eye in a new born child to report the same to the health officer within six hours after such discovery. It then becomes the duty of the health officer to furnish instructions for the proper treatment of the case. He is also required to furnish a copy of the law to every mid-wife and nurse in the place. It follows that it is his duty to discover all such persons. The most efficient means of doing so is to require all mid-wives and nurses to register with the board of health, and the board should provide therefore a register for that purpose. Enclosed will be found models for the various forms and certificates required.

BENJAMIN LEE,  
Secretary.



(F. 31.)  
STATE BOARD OF HEALTH MODEL FORM.  
REGISTER OF UNDERTAKERS.

Board of Health of . . . . . County.

Date	License Number.	Name.	Residence.	Place of Business.	Remarks.





(F. -34.)  
STATE BOARD OF HEALTH MODEL FORM.  
**PLUMBERS REGISTER.**  
*Board of Health of . . . . . County, Penna.*

Date.	Name.	Registered number.	Place of Business.	Master or Journeyman.	Remarks.

(F. 35.)

State Board of Health Model Form.

Plumber's Certificate of Registry.

Board of Health.

.....189....  
 This certifies that .....  
 engaged in business at.....  
 has duly registered at the office of the Board of Health of the  
 ..... of .....  
 as a

MASTER PLUMBER

pursuant to the provisions of the Act of Assembly, entitled "An Act  
 authorizing the Boards of Health in the cities and boroughs  
 of this Commonwealth to regulate House Drainage, the Reg-  
 istration of Journeymen and Master Plumbers, and the Con-  
 struction of Cess-pools," approved June 24th. A. D. 1895.

Secretary.

Registered No. ....

(F. 36.)

State Board of Health Model Form.

Plumber's Certificate of Registry.

Board of Health.

.....189....  
 This certifies that .....  
 engaged in business at.....  
 has duly registered at the office of the Board of Health of the  
 ..... of .....  
 as a

JOURNEYMAN PLUMBER

pursuant to the provisions of the Act of Assembly, entitled "An Act  
 authorizing the Boards of Health in the cities and boroughs  
 of this Commonwealth to regulate House Drainage, the Reg-  
 istration of Journeymen and Master Plumbers, and the Con-  
 struction of Cess-pools," approved June 24th, A. D. 1895.

Secretary.

Registered No. ....

(F. 37.)

State Board of Health Model Form.

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 PHYSICIAN'S CERTIFICATE.
 

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.....189

To the Principal, Superintendent or Teacher of

.....School

I hereby certify that ..... who has recently been affected with ..... has recovered from the same, that, in accordance with the requirements of Section 10 of the Act of June 18th, 1895, thorough disinfection of the premises in which the sickness took place has been performed, and that a period of thirty days has elapsed since said recovery and disinfection.

..... M. D.

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 (F. 38).

State Board of Health Model Form.

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 PHYSICIAN'S CERTIFICATE.
 

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.....189

To the Principal, Superintendent or Teacher of

.....School

I do hereby certify that the premises No. .... Street, in which ..... resides, and in which there has recently been a case of ....., have been thoroughly disinfected, in accordance with the provisions of Section 10 of the Act of June 18th, 1895, and that a period of thirty days has elapsed since the completion of such disinfection.

..... M. D.



(F. 39.)

## State Board of Health Model Form.

## HEALTH OFFICER'S NOTIFICATION.

Office of the Board of Health.

.....189

To..... No..... Street.

In accordance with Section 2 of the act of June 26th, 1895, for the "Prevention of Blindness" it is my duty to notify you that the infant reported as having swollen or reddened eyes at your residence under your care, is in great danger of losing its sight unless the following directions are carefully and fully complied with:

## Directions to the Mid-Wife or Nurse.

1. Gently open the lids and wash out the eyes with pure luke-warm water which has been boiled, using a clean, soft piece of old linen or muslin or a pledget of absorbent cotton, not a sponge.

2. Then immediately drop into each eye one or two drops of a 2 per cent. solution of Nitrate of Silver. The appended prescription for this solution may be cut off and sent to the apothecary.

3. Half an hour later wash out the eyes with warm salt and water (a teaspoonful of table salt to a pint of boiled water) or with a solution of Boric Acid (ten grains to two tablespoonfuls of boiled water) and continue this last application every hour or two until the eyes are well, gradually lengthening the time.

This disease is very catching and very dangerous to grown up persons. Therefore bathe or burn all cloths that have touched the eyes avoid kissing the child, wash your hands after bathing the eyes and allow no one else to use the same basin.

Official Prescription Authorized by the State Board of Health

Argent. Nitrat. 3jss.

℥i.

Aq. dest. ʒi.

℥i.

℞. solutio.

℞. Drop one or two drops into each eye, four times.

For external use only.

..... Health Officer.

(F. 40.)

## State Board of Health Model Form.

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 PHYSICIAN'S CERTIFICATE OF VACCINATION.
 

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.....189

I hereby certify, from personal examination, that

..... Age .....

Residence .....

has been successfully vaccinated, or has had Small-pox.

..... M. D.

.....Residence.

(Reverse side of above Certificate.)

## PHYSICIAN'S CERTIFICATE.

That . . . . .  
 is vaccinated, or has previously had small-pox.

"All principals or other persons in charge of schools as aforesaid, are hereby required to refuse the admission of any child to the schools under their charge or supervision except upon a certificate signed by a physician setting forth that such child has been successfully vaccinated, or that it has previously had small-pox."—Section 12, Act of Assembly, June 18, 1895.

The penalty for violation of the provisions of this section is punishment by a fine or by imprisonment.

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 BACTERIOLOGICAL DIAGNOSIS OF DIPHTHERIA.
 

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Commonwealth of Pennsylvania,  
 State Board of Health,  
 Executive Office, 1532 Pine Street,  
 Philadelphia, February 15th, 1896.

Circular.

To Boards of Health and Physicians in Pennsylvania:

It is the purpose of the State Board of Health to extend to physicians throughout the State, the same facilities that are furnished by the local boards of health in the large cities, in the matter of diagnosis by bacteriological examination of cases suspected of being diphtheria, including membranous croup.

In order to do so the Board will arrange to have the tests made by its Bacteriologists, charging the local authorities of town rates

proportionate to their population. For the specified rates, which are given below, sterile swabs in tubes will be placed with the local boards of health. These, having been charged with the supposed infectious material by the attending physician, will be shipped by express to the Bacteriologist, and a report will be returned within 24 hours whether or not the case is diphtheritic.

As a very important sanitary measure, all boards of health even of small towns, should avail themselves of this opportunity.

Diphtheria in many cases, especially in its early stages, can only be diagnosticated by means of a microscopical examination, and this only after the germ of the disease has been properly cultivated.

Moreover, in many instances diphtheria has been contracted from cases apparently recovered. After the membrane disappears from the throat the germs often persist many days, and the patient although to outward appearances well, can continue to transmit the disease to others. A bacteriological examination will determine this point to a certainty. Local boards of health should therefore make it a rule not to raise quarantine in cases of diphtheria until a bacteriological examination has proved the absence of infecting germs from the throat of the patient. This precaution is now taken in most of our large cities, with excellent results. There is no good reason why residents of small towns, or even of rural districts, should not enjoy similar protection.

#### Rates of Charge.

	<i>Per annum.</i>
For towns having a population of 5,000, .....	\$15 00
For towns having a population of 10,000 .....	25 00
For towns having a population of 15,000 .....	30 00
For towns having a population of 20,000 .....	35 00
For towns having a population of 25,000 .....	40 00
For towns having a population of 30,000 .....	45 00
For towns having a population of 30,000 to 50,000, .....	50 00
For towns having a population above 50,000.....	100 00

A proportionate number of sterile swabs, not less than 12, ready for immediate use and with full directions, will be at once sent to each town availing itself of this opportunity.

If preferred, the tubes and swabs will be furnished to boards of health at the rate of \$10.00 per dozen.

Individual examinations can also be obtained by physicians and private individuals at the rate of \$1.50 per examination, or \$2.00 if both primary and secondary examinations are desired, expressage prepaid.

BENJ. LEE, M. D.,  
Secretary State Board of Health.

To . . . . .  
 Secretary Board of Health . . . . .  
 . . . . . County,  
 Penna.

Bacteriological  
 Laboratory,  
 5450 Germantown Ave.,  
 Philadelphia.

Station "G."

Dr. Robert L. Pitfield.

— From —

THE STATE BOARD OF HEALTH  
 OF PENNSYLVANIA.

Benjamin Lee, M. D., *Secretary.*

STATE BOARD OF HEALTH OF PENNSYLVANIA.

Benjamin Lee, M. D., Secretary,  
 1532 Pine Street, Philadelphia.

Bacteriological Diagnosis.

Directions.—Read Carefully.

Remove the swab from its envelope, being careful not to touch the cotton either with the fingers or to anything else. Use the swab, if possible, before applying antiseptics to the throat. Apply the cotton firmly to membrane in the throat with a twisting motion. Cut the stick in two with scissors and drop the swab into the sterilized glass jar. Screw on the lids tightly. Fill up the card completely and mail it separately.

Designate also on the address label of the box from whom it comes, name of patient and P. O. address. Replies will be mailed within eighteen hours after receipt of swab. If desired, result will be telephoned or telegraphed at the expense of the applicant.

ROBERT L. PITFIELD, M. D.,  
 Assistant Bacteriologist, State Board of Health.  
 5450 Germantown Avenue,  
 Philadelphia, Station "G."

## Directions.

Remove swab from tube, and, being careful not to touch it to anything, rub it over the affected spot. Return to tube, close tightly and ship at once by express, prepaid. Try to use the swab before antiseptics have been applied to the throat. Have the card entirely filled out and return to the box.

To be Filled out by the Attending Physician.

Primary or secondary examination,..... Date,..... 18  
 Name of physician,.....  
 P. O. Address,.....  
 Patient's name, ..... Age..... Sex,.....  
 Address, .....  
 Duration of disease,.....  
 How contracted,.....  
 Location of membrane. ....  
 Was any antiseptic applied before swab was used? .....  
 What was it? .....  
 Remarks, .....

---

Commonwealth of Pennsylvania.  
 State Board of Health.  
 Executive Office, 1532 Pine Street.  
 Philadelphia, ..... 189

(Secretary Board of Health.)

.....Penn'a.

Dear Sir:

Bacteriological examination of the swab from the  
 throat of .....  
 sent by ..... 189  
 shows that the case is .....

Yours truly,

BENJAMIN LEE, M. D.,  
 Secretary.

R. L. PITFIELD, M. D.,  
 Assist. Bacteriologist.  
 5450 Germantown Ave.,  
 Philadelphia.

WATER ANALYSIS.

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Commonwealth of Pennsylvania,  
State Board of Health,  
Executive Office, 1532 Pine Street,  
Philadelphia,.....189 .

Dear Sir:

Replying to your request for an analysis of water by the State Board of Health I would say that, owing to the limited appropriation for the uses of the Board it is not possible to furnish analyses free of expense. A charge of \$7.50 is therefore made for either a chemical or a bacteriological examination. Both of these examinations are desirable in testing water to be used for drinking purposes, but either will be made alone if desired. The Board furnishes bottles, properly prepared and boxed for transportation, for taking samples, and will receive specimens only in these bottles. On receiving notification from you how many samples you desire to have analyzed I will forward the necessary number of bottles. The analysis will be made, however, only in conformity with the following conditions:

1. The instructions for taking the sample, on the box containing the bottle, must be strictly complied with.

2. A statement must be sent at the same time with the sample, of the conditions under which the sample was taken, and surrounding the source of the supply. These are, a. the presence of any epidemic disease, b. the nature of the source; that is, ordinary pump well, driven well, artesian well, spring, river or stream, reservoir, cistern or hydrant, c. opportunities for pollution, which may be, access of cattle to a stream, cess pool built over a stream, sewers or drains of manufacturing establishments, emptying into a stream, the proximity of a cess pool, or sink containing foul material, to a well, or other similar conditions.

3. Date of taking samples and names of persons present, with official positions if any, must be given.

The above mentioned conditions are rendered necessary by the fact that analysis alone cannot be implicitly relied upon to determine the character of a water. The presence of chemical constituents, which would condemn a water liable to certain sources of pollution as absolutely unfit to be taken into the human system, might, in a water not exposed but, in consequence of the geological formation, from which it sprung, containing the same earthly salts, possess no such significance. It is impossible therefore, for the analyst to answer the question usually put, "Is this a wholesome water?" unless he is in possession of all the data essential to form an opinion.

With regard to the bacteriological evidence, it must also be borne in mind that, while the presence of the germs which accompany a particular disease would absolutely condemn the water, their absence would not necessarily prove that the water had not been the cause of disease, from the fact that disease germs, unlike chemical substances, are distributed very unevenly through water and a given sample might not contain them, while one taken at another point might be rich in them.

It is scarcely necessary to say how easily a test can be vitiated by carelessness in collecting samples, by which extraneous polluting matter may be introduced.

Awaiting your further pleasure, I am,

Yours very respectfully.

BENJAMIN LEE,

Secretary.

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(Form 29—A.)

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## STATE BOARD OF HEALTH OF PENNSYLVANIA.

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### Instructions for Taking Samples of Water.

1. This box contains a jar prepared for a water sample. It is absolutely clean and needs no rinsing. Untie the cap, remove stopper and allow it to hang from jar while filling. Fill with water to within one inch of neck, and replace stopper and cap, which should be tied down.

2. In taking samples from streams, ponds, or reservoirs, it is necessary to submerge the jar several inches so as to avoid collecting any water that has been in contact with the air, and to avoid the dirt and dust usually found floating on the surface.

Samples from public water supplies should be drawn from a hydrant in direct communication with the main, and not from a cistern, storage tank or dead end of pipe.

In the case of pump wells, a few gallons of water should be pumped out before taking the sample, in order to remove that which has been standing in the pipe.

3. Do not allow the water to flow over the hands on its way to the jar.

*Great care is needed to secure absolute cleanliness in taking a water sample.*

4. It is very important that the sample be so collected as to represent the true average condition of the water as it is used.

5. Repack with care to avoid striking of the jar against the sides of the box.

Samples should be sent carriage paid, to  
Dr. FRANCIS C. PHILLIPS,  
Chemist, State Board of Health,  
Western University, Allegheny, Pennsylvania.

(Form No. 39.)

Commonwealth of Pennsylvania.

State Board of Health.

Philadelphia, ..... 189

To the Secretary of the State Board of Health:

Sir: I respectfully ask permission to remove the remains of  
....., who died of .....  
on the ..... day of ....., 189 ,  
from ..... to .....

The reasons for requesting this permit are the following:

.....  
.....  
.....  
.....

The remains will be prepared and enclosed in accordance with the regulations of the State Board of Health.

.....  
.....

Commonwealth of Pennsylvania.

State Board of Health.

Lewisburgh, Pa., Aug. 1, 1896.

.....

County Medical Inspector for State Board of Health.

Dear Doctor: The State Board of Health desires to collect information in reference to the effects upon the water supplies of the



State, produced by the discharge of the waste from tanneries into running streams. Will you kindly answer on this sheet the following questions and forward them in the enclosed stamped envelope to the undersigned?

1. Name the tanneries in your county, and the streams upon which located..

.....  
.....

2. What organic substances do these establishments throw into the streams?

.....

3. What are the effects, evident to the senses, produced in the water, by these substances? .....

4. Have you known water to be made unfit for use of men or animals by tannery refuse? ..... When? .....

.....

5. What is the effect upon fish in the streams? Are they killed?

.....

6. Have you known of any complaints against this mode of polluting streams?

.....

7. Have you in your county any other agencies polluting your streams? If so, name them: .....

.....  
.....

Yours very truly,

.....

Member, State Board of Health.



Form for Using the Formation of Associated Health Authorities  
in Counties.

Commonwealth of Pennsylvania.

State Board of Health,  
Executive Office,  
Philadelphia, March 25th, 1896.

Dr. ...., County Medical Inspector, .....  
....., Pa.:

Dear Doctor: At the last regular meeting of the State Board of Health it was "Resolved, That it was desirable that the several boards of health in each county should unite in forming an association for the purpose of aiding and stimulating one another in their work, and of promoting public health and uniformity of sanitary administration in their respective counties. The Secretary was instructed to bring this matter to the notice of the county medical inspectors and to suggest that in each county in which such an association does not already exist they should take the initiative by communicating with the several local boards of health and urge upon them the advantages to be thus attained.

It is considered desirable also that the several county associations should be in direct affiliation with the association known as The Associated Health Authorities of Pennsylvania, and send delegates to its annual meeting. In this connection I may state that the central association at its last annual meeting adopted a by-law providing that any county association may obtain representation in that body on the payment of \$2.50 for each local board represented therein.

I enclose a form for by-laws for such associations which can be adopted with such alterations and modifications as each individual association may deem desirable, maintaining however, the leading features of the form proposed.

It will be remembered that local boards applying directly to the central association are expected to pay an annual due of \$5.00. By the plan now proposed they will be enabled to obtain the advantages of representation in the county and State associations at the same time at certainly not a greater, and possibly at a less expense. This will entitle each board so represented to a copy of the quarterly entitled "Public Health," in which the proceedings of the Associated Health Authorities of Pennsylvania will be published, together with much additional valuable information on sanitary matters. Under the clause of the proposed by-laws entitled "Membership," you would be entitled to election in such an association as an associate member.

(Signed.)

Yours very truly,

BENJAMIN LEE, M. D.,  
Secretary.

*Dictated to H. J. M.*

## APPENDIX L.

1896-7.

LIST OF LOCAL BOARDS OR BUREAUS OF HEALTH AND  
SANITARY COMMITTEES IN PENNSYLVANIA, ARRANGED  
ALPHABETICALLY.

## Cities.

<i>Name.</i>	<i>County.</i>	<i>Secretary, Health Officer or Superintendent.</i>
Allegheny, .....	Allegheny, .....	Jas. A. McLaughlin, Supt. Bureau Health.
Allentown, .....	Lehigh, .....	C. C. Bingaman, Sec'y Board of Health.
Altoona, .....	Blair, .....	J. B. Anderson, Sec'y Board of Health.
Bradford, .....	McKean, .....	J. A. Lindsey, Sec'y Board of Health.
Carbondale, .....	Lackawanna, .....	S. S. Jones, Sec'y Board of Health.
Chester, .....	Delaware, .....	A. D. Pierce, Sec'y Board of Health.
Corry, .....	Erie, .....	G. A. Elston, Sec'y Board of Health.
Erie, .....	Erie, .....	W. S. Nason, Sec'y Board of Health.
Easton, .....	Northampton, .....	H. S. Rute, Sec'y Board of Health.
Franklin, .....	Venango, .....	E. Jeunet, Sec'y Health Commissioners.
Harrisburg, .....	Dauphin, .....	O. B. Simmons, Chr. San. Com.
Hazleton, .....	Luzerne, .....	J. B. McCartney, Sec'y Board of Health.
Johnstown, .....	Cambria, .....	C. H. Wehn, Sec'y Board of Health.
Lancaster, .....	Lancaster, .....	M. W. Raub, Sec'y Board of Health.
Lebanon, .....	Lebanon, .....	A. C. Hersh, Sec'y Board of Health.
Meadville, .....	Crawford, .....	J. G. Foster, Sec'y Board of Health.
McKeesport, .....	Allegheny, .....	A. C. Wallace, Sec'y Board of Health.
New Castle, .....	Lawrence, .....	S. R. Kelley, Health Officer, B. of H.
Oil City, .....	Venango, .....	G. S. Bredin, Sec'y Board of Health.
Philadelphia, .....	Philadelphia, .....	A. A. Hirst, Sec'y Board of Health.
Pittsburg, .....	Allegheny, .....	Crosby Gray, Supt. Bureau of Health.
Pittston, .....	Luzerne, .....	John Lovell, Sec'y Board of Health.
Reading, .....	Berks, .....	Jas. Hagen, Sec'y Board of Health.
Scranton, .....	Lackawanna, .....	Walter Briggs, Sec'y Board of Health.
Titusville, .....	Crawford, .....	W. G. Johnston, Sec'y Board of Health.
Wilkes-Barre, .....	Luzerne, .....	J. G. Meyers, Chr. Sanitary Committee.
Williamsport, .....	Lycoming, .....	Dr. A. Richter, Health Officer, B. of H.
York, .....	York, .....	Dr. J. Frank Small, Health Officer.

## Borough Boards of Health.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Adamstown, .....	Lancaster, .....	
Aldan, Adamsford P. O., .....	Delaware, .....	R. E. Dickson.
Ambler, .....	Montgomery, .....	Jas. Bartleson.
Archbald, .....	Lackawanna, .....	
Arnold, .....	Westmoreland, .....	Wm. Van Doren, M. D.
Ashley, .....	Luzerne, .....	
Aspinwall, .....	Allegheny, .....	G. V. Bowman.
Atglen, .....	Chester, .....	W. E. Whan n .
Athens, .....	Bradford, .....	Miles Finch.
Atwood, .....	Armstrong, .....	J. D. McLean.
Auburn, .....	Schuylkill, .....	Lewis T. Schulze.
Austin, .....	Potter, .....	S. H. Van Valkenberg.
Avaion, .....	Allegheny, .....	T. R. Perry.
Avondale, .....	Chester, .....	Bertha S. Cope.
Bangor, .....	Northampton, .....	Chas. K. Stier.
Barnesboro, .....	Cambria, .....	
Bath, .....	Northampton, .....	J. O. Berlin.
Beaver, .....	Beaver, .....	Wm. C. French.
Beaver Falls, .....	Beaver, .....	G. S. Boyd, M. D.
Bechtelsville, .....	Berks, .....	
Bedford, .....	Bedford, .....	Jas. Z. Frazier.
Bellefonte, .....	Centre, .....	H. C. Quigley.
Belle Vernon, .....	Fayette, .....	
Bellwood, .....	Blair, .....	
Beltzhoover, .....	Allegheny, .....	H. F. Byrom.
Ben Avon, 66 Federal St., Allegheny P. O., .....	Allegheny, .....	H. W. Armstrong.
Bendersville, .....	Adams, .....	D. P. Delop.
Bennett, .....	Allegheny, .....	
Benton, .....	Columbia, .....	John F. Wright.
Berlin, .....	Somerset, .....	Z. T. Kimmel.
Berrysburg, .....	Dauphin, .....	E. W. Holtzman.
Berwick, .....	Columbia, .....	J. W. Evans.
Bethlehem, .....	Northampton, .....	Theo. O. Fradeneck.
Big Run, .....	Jefferson, .....	Henry I. Wilson.
Birdsboro, .....	Berks, .....	C. K. Rhoads.
Blairsville, .....	Indiana, .....	A. T. Rutledge, M. D.
Blakely, Peckville P. O., .....	Lackawanna, .....	S. M. Rogers.
Bloomfield, New Bloom- field P. O., .....	Perry, .....	H. E. Shibley.
Blossburg, .....	Tioga, .....	Jos. H. Mold.
Bolivar, .....	Westmoreland, .....	Jos. B. Hammond.
Boyertown, .....	Berks, .....	L. P. G. Fegley.
Braddock, .....	Allegheny, .....	William Dillon.
Bridgeport, .....	Montgomery, .....	Jno. P. Glisson.
Bristol, .....	Bucks, .....	Jesse O. Thomas.
Brockawayville, .....	Jefferson, .....	H. B. McCullough.
Brookville, .....	Jefferson, .....	C. P. O'Loughlin.
Brushtown, .....	Allegheny, .....	Geo. McKee, Jr.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Bunker Hill, Morris Cross		
Roads P. O.,	Fayette,	J. H. Johnson.
Burgettstown, So. Bur-		
gettstown, P. O.,	Washington,	William Melvin.
Burlington,	Bradford,	C. T. Kellogg.
Burnside,	Clearfield,	
Butler,	Butler,	Donald M. Ward.
Cambridgeboro,	Crawford,	
Camp Hill,	Cumberland,	A. L. Shope, M. D.
Canonsburg,	Washington,	
Canton,	Eradford,	Chas. D. Derrat.
Carlisle,	Cumberland,	Conrad Hambleton.
Carmichaels,	Greene,	T. J. Cragg.
Carrolltown,	Cambria,	J. S. Wetzell.
Casselman,	Somerset,	
Catasauqua,	Lehigh,	A. A. Glick.
Catawissa,	Columbia,	R. M. Graham.
Centralia,	Columbia,	W. W. Heffner.
Centre Hall,	Centre,	R. D. Forman.
Centreville, Slippery Rock		
P. O.,	Butler,	M. H. Wilson.
Centreville,	Crawford,	T. J. Patton.
Chambersburg,	Franklin,	George Denton.
Charleroi,	Washington,	R. A. Roberts.
Chester Hill, Phillipsburg		
P. O.,	Clearfield,	
Christy Park,	Allegheny,	J. C. Wiltshire.
Clarion,	Clarion,	J. W. Greenland.
Clayville,	Jefferson,	J. W. Stauffer.
Claysville,	Washington,	H. H. McDonough, M. D.
Clearfield,	Clearfield,	
Clifton Heights,	Delaware,	E. G. Lamey.
Clintonville,	Venango,	T. M. Hoffman.
Coalmont,	Huntingdon,	Jno. W. Lytle.
Coalport,	Clearfield,	F. J. Buck.
Coaldale, Six Mile Run		
P. O.,	Bedford,	
Coatesville,	Chester,	Chas. Minsted.
Cokeville,	Westmoreland,	J. Milliron.
Collingdale,	Delaware,	R. Walter Beatty.
Columbia,	Lancaster,	S. Atlee Bockius, M. D.
Colwyn,	Delaware,	F. J. Pennington.
Confluence,	Somerset,	
Connellsville,	Fayette,	Chas. E. DeMuth.
Conshohocken,	Montgomery,	C. B. Woodward.
Coopersburg,	Lehigh,	Henry F. Trumbauer.
Coopersdale, Johnstown		
P. O.,	Cambria,	C. H. Loughy.
Cooperstown,	Venango,	H. B. Bradley.
Coplay,	Lehigh,	
Coraopolis,	Allegheny,	J. D. Hamilton.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Coulterville, .....	Allegheny, .....	
Coudersport, .....	Porter, .....	H. C. Olmstead.
Crafton, .....	Allegheny, .....	Harry A. Meredith.
Cressona, .....	Schuylkill, .....	John W. Smith.
Curwensville, .....	Clearfield, .....	L. C. Norris.
Dallas, .....	Luzerne, .....	W. H. Capwell.
Dallastown, .....	York, .....	H. Q. Sechrist.
Dalton, .....	Lackawanna, .....	A. G. Ives.
Danville, .....	Montour, .....	Edward W. Peters, M. D.
Darby, .....	Delaware, .....	Jas. McGahey.
Dauphin, .....	Dauphin, .....	E. E. McKissick.
Dawson, .....	Fayette, .....	
Dayton, .....	Armstrong, .....	Miss T. E. Lindsay.
Delaware Water Gap, ...	Monroe, .....	John J. Burd.
Delta, .....	York, .....	Isaac H. Stubbs.
Derry Station, .....	Westmoreland, .....	
Dickson City, .....	Lackawanna, .....	Geo. Gleason.
Dillsburg, .....	York, .....	H. W. Fishel.
Dorrancton, .....	Luzerne, .....	Gilbert Berlen.
Downingtown, .....	Chester, .....	Thos. E. Parke, M. D.
Doylestown, .....	Bucks, .....	C. D. Hotchkiss.
Driftwood, .....	Cameron, .....	John T. Earle.
Du Bols, .....	Clearfield, .....	W. S. Lusher.
Dunbar, P. O. Box 71, ...	Fayette, .....	J. N. Anderson.
Duncannon, .....	Perry, .....	Chas. L. DePugh.
Duncansville, .....	Blair, .....	
Dunmore, .....	Lackawanna, .....	B. W. Cooney.
Dushore, .....	Sullivan, .....	
East Bangor, .....	Northampton, .....	S. J. Smith.
East Berlin, .....	Adams, .....	J. L. Hildebrand.
East Bethlehem, .....	Washington, .....	
East Brady, .....	Clarion, .....	R. Robinson, M. D.
East Greensburg, Greens-		
burg, P. O., .....	Westmoreland, .....	A. C. Remaley.
East Mauch Chunk, .....	Carbon, .....	
East Stroudsburg, .....	Monroe, .....	James Fabel.
East Sunbury, .....	Northumberland, .....	
Ebensburg, .....	Cambria, .....	H. A. Englehart.
Edenburg, Knox P. O., ...	Clarion, .....	J. M. Brothers.
Edgewood, .....	Allegheny, .....	C. W. Wade.
Edgewood Park, .....	Allegheny, .....	C. F. H. Hawkins.
Edinborough, .....	Erle, .....	J. W. Niles.
Edwardsville, .....	Luzerne, .....	M. Dando.
Eldred, .....	McKean, .....	J. H. Coon.
Elizabeth, .....	Allegheny, .....	
Elizabethtown, .....	Lancaster, .....	John H. Epler.
Elizabethville, .....	Dauphin, .....	
Elkland, ..	Tioga, .....	R. T. Wood.
Ellcott, .....	Allegheny, .....	G. W. Gray.
Ellwood City, .....	Lawrence, .....	

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Elmhurst, .....	Lackawanna, .....	J. H. Snyder, M. D.
Emaus, .....	Lehigh, .....	H. L. Reber.
Emlenton, .....	Venango, .....	H. A. Hamilton.
Emporium, .....	Cameron, .....	Chas. Bonham.
Ephrata, .....	Lancaster, .....	W. L. Biler.
Esplen, McKees Rocks P. O., .....	Allegheny, .....	E. J. Sutherland.
Exeter, Pittston P. O., .....	Luzerne, .....	S. L. Geddis.
Factoryville, .....	Wyoming, .....	A. H. Fassett.
Fairchance, .....	Fayette, .....	R. T. Gribble.
Fall Brook, .....	Tioga, .....	R. W. Davis.
Fallston, .....	Beaver, .....	Walter Husan.
Fayette City, .....	Fayette, .....	
Fleetwood, .....	Berks, .....	Amandus Kern.
Flemington, .....	Clinton, .....	Geo. A. Beck, M. D.
Forest City, .....	Susquehanna, .....	J. V. LeRoy.
Forksville, .....	Sullivan, .....	Geo. C. Wright.
Forty Fort, .....	Luzerne, .....	H. H. Hadsall.
Fountain Hill, S. Bethlehem P. O., .....	Northampton, .....	Harry Clark.
Frackville, .....	Schuylkill, .....	Thos. M. Reed.
Franklintown, .....	York, .....	
Fredonia, .....	Mercer, .....	
Freedom, .....	Beaver, .....	Milo J. Hamilton.
Freeland, .....	Luzerne, .....	G. D. Morton, M. D.
Freemansburg, .....	Northampton, .....	Warren Roberts.
Gallitzin, .....	Cambria, .....	Frank Cronour.
Geneva, .....	Crawford, .....	Homer McEntire.
Gettysburg, .....	Adams, .....	J. R. Dickson, M. D.
Gilberton, .....	Schuylkill, .....	W. J. Murphy.
Girard, .....	Erie, .....	W. Wheaton.
Girardsville, .....	Schuylkill, .....	Albert Arnold.
Glen Campbell, .....	Indiana, .....	H. E. Ruffner, D. D. S.
Glendon (Station 1), Easton P. O., .....	Northampton, .....	Daniel Collins.
Glenfield, .....	Allegheny, .....	Alexander Winters.
Glen Rock, .....	York, .....	Geo. M. Leader.
Gordon, .....	Schuylkill, .....	G. H. Uhler.
Great Bend, .....	Susquehanna, .....	
Green Castle, .....	Franklin, .....	Watson R. Davison.
Green Lane, .....	Montgomery, .....	Henry W. Graul.
Greensboro, .....	Greene, .....	J. F. Williams, M. D.
Greensburg, .....	Westmoreland, .....	Sidney J. Potts.
Greenville, .....	Mercer, .....	John W. Vosler.
Grove City, .....	Mercer, .....	E. M. McConnell, M. D.
Halifax, .....	Dauphin, .....	A. H. Putt.
Hallstead, .....	Susquehanna, .....	A. F. Merrell, M. D.
Hamburg, .....	Berks, .....	
Hanover Nanticoke P. O., .....	Luzerne, .....	Lorin A. Rohrbaugh.



<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Hanover, .....	York, .....	L. A. Rohrbaugh.
Harmony, .....	Butler, .....	
Hartstown, .....	Crawford, .....	
Hastings, .....	Cambria, .....	L. A. Nevling.
Hatboro, .....	Montgomery, .....	Paul Jones.
Hawley, .....	Wayne, .....	S. R. Evans.
Hellertown, .....	Northampton, .....	
Homer City, .....	Indiana, .....	
Homestead, .....	Allegheny, .....	D. H. Knoble.
Honesdale, .....	Wayne, .....	Fred. W. Powell, M. D.
Honey Brook, .....	Chester, .....	A. M. Anderson.
Hopbottom, .....	Susquehanna, .....	N. M. Finn.
Houtzdale, .....	Clearfield, .....	Ferd. Todd, M. D.
Hughestown, Pittston P. O., .....	Luzerne, .....	
Hughesville, .....	Lycoming, .....	W. C. Frontz.
Hulmeville, .....	Bucks, .....	
Huntingdon, .....	Huntingdon, .....	J. R. Patton.
Hyndman, .....	Bedford, .....	
Indiana, .....	Indiana, .....	James H. St. Clair.
Irvona, .....	Clearfield, .....	J. H. Moss.
Jamestown, .....	Mercer, .....	J. M. Christ, M. D.
Jeannette, .....	Westmoreland, .....	R. T. Hugus.
Jefferson, .....	Greene, .....	
Jenkintown, .....	Montgomery, .....	J. G. Frank.
Jermyn, .....	Lackawanna, .....	S. D. Davis, M. D.
Johnsonburg, .....	Elk, .....	S. R. Clawson.
Jonestown, .....	Lebanon, .....	John M. Crist.
Juniata, .....	Blair, .....	U. G. Pheasant.
Kennett Square, .....	Chester, .....	Frank L. Beeby.
Kingston, .....	Luzerne, .....	Albert E. Miller.
Kinzua, .....	Warren, .....	
Kipple, Juniata P. O., ....	Blair, .....	U. G. Pheasant.
Kittanning, .....	Armstrong, .....	
Knoxville, Mt. Oliver P. O., .....	Allegheny, .....	J. P. Moore.
Kutztown, .....	Berks, .....	J. L. Petus, M. D.
Lackawaxen, .....	Pike, .....	
Landingville, .....	Schuylkill, .....	
Lafin, .....	Luzerne, .....	
Lanesboro, .....	Susquehanna, .....	J. N. Reynolds.
Langhorne, .....	Bucks, .....	
Lansdale, .....	Montgomery, .....	
Lansdowne, .....	Delaware, .....	John W. Davis.
Lansford, .....	Carbon, .....	Nathan Tanner.
La Porte, .....	Sullivan, .....	Thos. J. Ingham.
La Plume, .....	Lackawanna, .....	Geo. Sisson.
Latrobe, .....	Westmoreland, .....	J. C. B. Stockberger.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Lawrenceville, .....	Tioga, .....	David Craft.
Leechburg, .....	Armstrong, .....	E. Bredin.
Leighton, .....	Carbon, .....	S. R. Gilham.
Le Raysville, .....	Carbon, .....	F. M. Wheaton.
Lewisburg, .....	Union, .....	T. C. Thornton.
Lewistown, .....	Mifflin, .....	
Liberty, .....	Tioga, .....	M. B. Mott.
Ligonier, .....	Westmoreland, .....	
Lilly, .....	Cambria, .....	John W. Rainey.
Lindsey, .....	Jefferson, .....	W. J. Quinlisk.
Linesville, .....	Crawford, .....	A. A. Graff.
Lititz, .....	Lancaster, .....	Israel G. Erb.
Little Meadows, .....	Susquehanna, .....	A. Graves.
Littlestown, .....	Adams, .....	F. E. Taylor.
Lock Haven, .....	Clinton, .....	
Lockport, Treichlers P. O.,	Northampton, .....	
Lockport, Plateau P. O.,	Erle, .....	H. S. Barnes.
Logansville, .....	York, .....	C. G. Hildebrand.
Loganton, .....	Clinton, .....	A. L. Heller.
Ludwick, Greensburg P. O., .....	Westmoreland.	
Luzerne, .....	Luzerne, .....	J. B. Wieder.
Lykens, .....	Dauphin, .....	J. J. John.
Mahaffy, .....	Clearfield, .....	
Mahoningtown, .....	Lawrence, .....	
Mahanoy City, .....	Schuylkill, .....	L. E. Lewis.
Mainesburg, .....	Tioga, .....	
Malvern, .....	Chester, .....	Caleb H. Malin.
Manchester, .....	York, .....	
Manhelm, .....	Lancaster, .....	H. C. Boyd.
Mann's Choice, .....	Bedford, .....	
Manor Station, .....	Westmoreland, .....	John Hough.
Manorville, .....	Armstrong, .....	
Mansfield, .....	Tioga, .....	
Mansfield, .....	Allegheny, .....	
Mapleton, .....	Huntingdon, .....	
Marcus Hook, .....	Delaware, .....	H. F. Larkin.
Marietta, .....	Lancaster, .....	J. W. Riff.
Markleysburg, .....	Fayette, .....	
Markelsburg, .....	Huntingdon, .....	
Marysville, .....	Perry, .....	
Masontown, .....	Bradford, .....	
Mauch Chunk, .....	Carbon, .....	Robert A. Heberling.
Mayfield, .....	Lackawanna, .....	W. J. Brigan.
Mechanicsburg, .....	Cumberland, .....	F. L. Coover.
Media, .....	Delaware, .....	Linnaeus Fussell, M. D.
Mehoopany, .....	Wyoming, .....	
Mercersburg, .....	Franklin, .....	
Mercer, .....	Mercer, .....	J. M. Campbell.
Meshoppen, .....	Wyoming, .....	F. H. Jarvis.
Meyersdale, .....	Somerset, .....	H. C. McKinley, M. D.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Middletown, .....	Dauphin, .....	
Mifflinburg, .....	Union, .....	Charles H. Dimm, M. D.
Mifflintown, .....	Junata, .....	
Milesburg, .....	Centre, .....	J. C. J. Jones.
Millersburg, .....	Dauphin, .....	J. F. Bowman.
Millford, .....	Pike, .....	J. H. Van Etten.
Millerstown, Chicora P. O.,	Büttler, .....	J. C. Galsford.
Mill Hall, .....	Clinton, .....	Jno. B. McCloskey.
Millvale, Bennett P. O.,	Allegheny, .....	L. D. Shearer.
Mill Village, .....	Erle, .....	
Millville, .....	Columbia, .....	Harry W. Eves.
Milton, .....	Northumberland, ..	J. S. Dougal.
Miners Mills, .....	Luzerne, .....	L. E. Weiss, M. D.
Minersville, .....	Schuylkill, .....	C. H. Phillips.
Monaca, .....	Beaver, .....	J. R. Gormley, M. D.
Monongahela City, .....	Washington, .....	
Montgomery, .....	Lycoming, .....	John W. Pratt.
Montoursville, .....	Lycoming, .....	
Montrose, .....	Susquehanna, ...	H. P. Read.
Morrellville, Johnstown P.		
O., .....	Cambria, .....	James Duncan.
Mount Carbon, Pottsville		
P. O., .....	Schuylkill, .....	
Mount Carmel, .....	Northumberland, ..	P. W. Hoffman.
Mount Jewett, .....	McKean, .....	
Mount Pleasant, .....	Westmoreland, .....	
Muncy, .....	Lycoming, .....	
McDonald, .....	Washington, .....	Robert J. Cook.
McKees Rocks, .....	Allegheny, .....	Geo. W. Brown.
McSherrystown, .....	Adams, .....	L. Grant Thomas.
Nanticoke, .....	Luzerne, .....	S. C. Thomas.
Narberth, .....	Montgomery, .....	A. P. Redifer.
Nazareth, .....	Northampton, .....	Frank Huth.
Nelson, .....	Tioga, .....	
New Albany, .....	Bradford, .....	
Newberry, .....	Lycoming, .....	
New Brighton, .....	Beaver, .....	D. L. McNees.
Newburg, .....	Cumberland, .....	D. C. Burkholder.
New Centreville, .....	Chester, .....	
New Centreville, Glade P.		
O., .....	Somerset, .....	
New Cumberland, .....	Cumberland, .....	
New Florence, .....	Westmoreland, .....	
New Freedom, .....	York, .....	C. B. King.
New Haven, .....	Fayette, .....	Eugene O'Donovan.
New Kensington, .....	Allegheny, .....	T. B. Beatty.
New Lebanon, .....	Mercer, .....	S. S. Overmoyer.
New Milford, .....	Susquehanna, .....	
New Oxford, .....	Adams, .....	
Newport, .....	Perry, .....	
New Salem, .....	Westmoreland, .....	

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Newtown, .....	Bucks, .....	Chas. B. Smith, M. D.
Newville, .....	Cumberland, .....	W. B. Reynolds, M. D.
New Washington, .....	Clearfield, .....	
New Wilmington, .....	Lawrence, .....	
Nicholson, .....	Wyoming, .....	Geo. F. Sprague.
Norristown, .....	Montgomery, .....	C. P. Weaver.
North Belle Vernon, .....	Fayette, .....	
North Clarendon, .....	Warren, .....	
North East, .....	Erie, .....	G. W. Blaine.
Northumberland, .....	Northumberland, .....	J. G. Dieffenbach.
North Wales, .....	Montgomery, .....	H. F. Silfer, M. D.
Norwood, .....	Delaware, .....	Jas. E. Loughlin, M. D.
Oakland, Susquehanna P.		
O., .....	Susquehanna, .....	William Johnston.
Ohiopyle, .....	Fayette, .....	O. F. M. Nicolay.
Olyphant, .....	Lackawanna, .....	F. L. Van Sickle, M. D.
Orbisonia, .....	Huntingdon, .....	
Orwigsburg, .....	Schuylkill, .....	W. H. Edwards.
Osceola Mills, .....	Clearfield, .....	
Oxford, .....	Chester, .....	J. R. Strickland.
Palo Alto, Pottsville P. O., Schuylkill, .....		
Parkesburg, .....	Chester, .....	John P. Wallace.
Parnassus, .....	Westmoreland, .....	F. G. Alter, M. D.
Patterson, .....	Juniata, .....	
Patton, .....	Cambria, .....	Harry J. McCormick, M. D.
Peckville, .....	Lackawanna, .....	D. R. Lathrop.
Pen Argyl, .....	Northampton, .....	G. N. Swartz, M. D.
Penn, Penn's Station P.		
O., .....	Westmoreland, .....	J. B. Smith.
Perkasie, .....	Bucks, .....	Samuel G. Stover.
Petersburg, .....	Huntingdon, .....	F. L. Stewart.
Petrolia, .....	Butler, .....	James M. Hawk.
Philipsburg, .....	Centre, .....	F. F. Irwin.
Phoenixville, .....	Chester, .....	J. E. Miller.
Picture Rocks, .....	Lycoming, .....	Chas. W. Longbay.
Pine Grove, .....	Schuylkill, .....	Geo. F. Thiel.
Pleasantville, Alum Bank		
P. O., .....	Bedford, .....	Scott U. Hammer.
Pleasantville, .....	Venango, .....	W. D. Beebe.
Plymouth, .....	Luzerne, .....	F. L. McKee, M. D.
Point Marion, .....	Fayette, .....	A. E. Huggins.
Port Carbon, .....	Schuylkill, .....	C. H. Moyer.
Port Royal, .....	Juniata, .....	C. B. M. Kepler.
Pottstown, .....	Montgomery, .....	John B. Evans.
Pottsville, .....	Schuylkill, .....	F. A. Wildermuth.
Prompton, .....	Wayne, .....	
Prospect Park, Moore P.		
O., .....	Delaware, .....	J. H. McFalls.
Punxsutawney, .....	Jefferson, .....	W. A. H. Streamer.
Quakertown, .....		
	Bucks, .....	J. V. Ommeren.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Rainsburgh, .....	Bedford, .....	F. A. Smith.
Rankin Station, .....	Allegheny, .....	E. F. McBride.
Red Lion, .....	York, .....	
Reno, .....	Venango, .....	
Renovo, .....	Clinton, .....	John W. Russell.
Reynoldsville, .....	Jefferson, .....	E. L. Evans.
Reynoldton, .....	Allegheny, .....	Chas. Dennen.
Ridgway, .....	Elk, .....	S. Th. Morehouse.
Ridley Park, .....	Delaware, .....	Frank D. Kane.
Rimersburg, .....	Clarion, .....	C. A. Wise.
Riverside, .....	Northumberland, .....	Zachary T. Arms.
Roaring Springs, .....	Blair, .....	
Rochester, .....	Beaver, .....	J. P. Leaf, C. E.
Rock Hill Furnace, .....	Huntingdon, .....	W. R. Smyers.
Rockledge, .....	Montgomery, .....	
Rockwood, .....	Somerset, .....	
Royalton, .....	Dauphin, .....	
Royersford, .....	Montgomery, .....	
Rutledge, .....	Delaware, .....	R. Kemp Welch.
Saegerstown, .....	Crawford, .....	
Salisbury, Elk Lick P. O., .....	Somerset.	
Salladasburg, .....	Lycoming, .....	C. B. Bastian.
Saxton, .....	Bedford, .....	F. J. Potter.
Sayre, .....	Bradford, .....	Wm. C. Barbour.
Schuylkill Haven, .....	Schuylkill, .....	Geo. W. Gise.
Scottdale, .....	Westmoreland, .....	W. H. Fette, M. D.
Sellingsgrove, .....	Snyder, .....	A. W. Potter.
Sewickley, .....	Allegheny, .....	
Shamokin, .....	Northumberland, .....	
Sharon, .....	Mercer, .....	
Sharon Hill, .....	Delaware, .....	J. G. Geissell.
Sharpsburg, .....	Allegheny, .....	Edward Krauss.
Sharpsville, .....	Mercer, .....	Samuel Dunham.
Sheakleyville, .....	Mercer, .....	
Shelocka, .....	Indiana, .....	S. M. Lowman.
Shenandoah, .....	Schuylkill, .....	J. W. Curtin.
Shickshinny, .....	Luzerne, .....	
Shippensburg, .....	Cumberland, .....	
Shippensville, .....	Clarion, .....	
Shiremanstown, .....	Cumberland, .....	S. S. Rupp.
Slatington, .....	Lehigh, .....	F. O. Ritter.
Smethport, .....	McKean, .....	
Somerset, .....	Somerset, .....	
Souderton, .....	Montgomery, .....	
South Bethlehem, Bethlehem P. O., .....	Northampton, .....	J. W. Martenis.
South Chester, Thuriow P. O., .....	Delaware, .....	William N. Erskine.
South Easton, Easton P. O., .....	Northampton, .....	J. S. Aldridge.
South Fork, .....	Cambria, .....	J. S. Paul.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
South Greensburg,		
Greensburg, P. O.,	Westmoreland,	Reuben H. Kemmerer.
South Renovo,	Clinton,	
Southwest Greensburg,		
Greensburg P. O.,	Westmoreland,	John Knoblock.
Spangler,	Cambria,	Milton Spencer.
Spartansburg,	Crawford,	
Springboro,	Crawford,	
Spring City,	Chester,	J. C. Mewhinney, M. D.
Spring Grove, Spring		
Forge P. O.,	York,	M. Hoke, M. D.
St. Clair,	Schuylkill,	B. P. Urch.
St. Clairsville,	Clarion,	
Steelton,	Dauphin,	J. M. Peters, M. D.
Stoneboro,	Mercer,	S. B. Throop.
St. Petersburg,	Bedford,	
Stoyestown,	Somerset,	
Strasburg,	Lancaster,	Geo. E. Day, M. D.
Strattonville,	Clarion,	
Stroudsburg,	Monroe,	H. E. Gregory, M. D.
Sugar Grove,	Warren,	E. D. McKee.
Sugar Notch,	Luzerne,	Michael Ginley.
Summer Hill,	Cambria,	
Summerville,	Jefferson,	
Summit Hill,	Carbon,	
Sunbury,	Northumberland,	Fred. K. Hill.
Susquehanna,	Susquehanna,	Daniel J. Lynch.
Swarthmore,	Delaware,	Joseph B. Rush.
Sylvania,	Bradford,	
Tamaqua,	Schuylkill,	Geo. C. Noll.
Tarentum,	Allegheny,	
Taylor,	Lackawanna,	John F. Stubbs.
Telford,	Montgomery,	F. H. Strohm.
Thompstontown,	Forest,	H. W. Wickersham.
Throop,	Lackawanna,	Patrick Corr.
Tidioute,	Warren,	Henry Ewald.
Tioga,	Tioga,	F. B. Smith.
Tionesta,	Forest,	T. F. Ritchey.
Topton,	Berks,	Chas. D. Werley, M. D.
Towanda,	Bradford,	
Tower City,	Schuylkill,	Harper T. Bressler.
Townville,	Crawford,	Harry Hatch, Ph. G.
Tremont,	Schuylkill,	John Marks.
Troy,	Bradford,	P. N. Barker, M. D.
Tullytown,	Bucks,	C. Monington.
Tunkhannock,	Wyoming,	S. J. Stam.
Turbotville,	Northumberland,	D. W. Dennis.
Turtle Creek,	Allegheny,	A. M. Meanor.
Tyrone,	Blair,	E. M. Taylor.
Ulysses,	Potter,	
Upland,	Delaware,	George Futh.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Ursina, .....	Somerset, .....	
Union City, .....	Erie, .....	W. J. Humphrey.
Unionville, Fleming P. O., Centre, .....		R. E. Cambridge.
Vallonia, .....	Crawford, .....	
Venango, .....	Crawford, .....	
Verona, .....	Allegheny, .....	
Versailles, .....	Allegheny, .....	
Wallacetown, .....	Clearfield, .....	
Warren, .....	Warren, .....	A. A. Davis.
Washington, .....	Washington, .....	Ed. R. Smith, Jr.
Washingtonville, .....	Montour, .....	C. S. Moser.
Waterford, .....	Erie, .....	A. H. Woodard.
Watsonstown, .....	Northumberland, .....	
Waverly, .....	Lackawanna, .....	
Waymart, .....	Wayne, .....	T. S. Stephenson.
Waynesboro, .....	Franklin, .....	
Waynesburg, .....	Greene, .....	W. W. Evans.
Weatherly, .....	Carbon, .....	E. G. Rouse.
Weissport, .....	Carbon, .....	W. H. Traub.
Wellshoro, .....	Tioga, .....	Anton Hardt.
West Bethlehem, Bethle-		
hem, .....	Northampton, .....	Samuel Clewell.
West Bridgewater, .....	Beaver, .....	
West Chester, .....	Chester, .....	Charles C. Woodland.
West Conshohocken, .....	Montgomery, .....	
West Elizabeth, .....	Allegheny, .....	J. C. Donaldson.
Westfield, .....	Tioga, .....	
West Indiana, Indiana-P.		
O., .....	Indiana, .....	Jas. H. St. Clair.
West Liberty, Mt. Leba-		
non P. O., .....	Allegheny, .....	
Westmont, Johnstown P.		
O., .....	Cambria, .....	J. W. Carter.
West New Castle, New		
Castle P. O., .....	Lawrence, .....	Isaac B. Griffith.
West Newton, .....	Westmoreland, .....	J. B. Secrist.
West Pittston, Pittston P.		
O., .....	Luzerne, .....	J. S. Hileman, M. D.
West Washington, .....	Washington, .....	
White Haven, .....	Luzerne, .....	
Wilkesburg, .....	Allegheny, .....	Jas G. Stover.
Williamstown, .....	Dauphin, .....	A. D. Zimmerman.
Wilmerding, .....	Allegheny, .....	Harry D. Patch.
Wilmore, .....	Cambria, .....	P. M. Brown.
Winterstown, .....	York, .....	
Winton, .....	Lackawanna, .....	
Worthington, .....	Armstrong, .....	F. Beck.
Worthville, .....	Jefferson, .....	W. H. Smith.
Wyalusing, .....	Bradford, .....	
Wyoming, .....	Luzerne, .....	C. W. Stiff.

<i>Name.</i>	<i>County.</i>	<i>Secretary.</i>
Yardley, .....	Bucks, .....	
Yatesville, Yates P. O., .....	Luzerne, .....	
Yeadon, .....	Delaware, .....	John J. Boyd.
York Haven, .....	York, .....	Henry F. Metzler.
Yorkville, Pottsville P. O., .....	Schuylkill, .....	Thos. C. Williams.
Zellenople, .....	Butler, .....	



## APPENDIX M.

## ADDITIONS TO LIBRARY.

List of Books Received from November 12, 1895, to November 12, 1896, by Gift or Exchange.

Infectious Diseases among Poultry, United States Department of Agriculture.

Medical communications of the Massachusetts Medical Society, Vol. XVI, No. 3, 1895.

Report of the Jefferson Medical College, 1894.

Report of the Board of Health of the State of Alabama—copies.

Final Report of the Commissioners on Leprosy of Cape of Good Hope, Cape Town, Africa, 1895. Henry De Smidt, Under Colonial Secretary, Cape Town, Africa.

Monthly Weather Review. Willis L. Moore, Chief of Weather Bureau.

Reports of the State Board of Health of Massachusetts, 1894. Samuel W. Abbott.

Fifteenth Annual Report of South Carolina Board of Health, 1894. Dr. James Evans.

Report on Sanitary State of City of Montreal, 1894. Louis Leberge.

Special Report on Bovine Tuberculosis on the Herd of Cattle belonging to the State Hospital for Insane at Norristown, 1895. Florence Hull Watson, M. D.

The Evolution of the Function of Public Health Administration, as illustrated by the Sanitary History of Glasgow, in the Nineteenth Century, and especially since 1854, with an exposition of results. James B. Russell, B. A., M. D., LL. D.

Annual Report of the Supervising Surgeon-General of the Marine Hospital Service. Washington, D. C., 1894. Walter Wyman, M. D.

Thirteenth Annual Report of the Executive Committee of the Indian Rights Association, year ending December 14, 1895. Herbert Welsh.

Report of the Board of Health of the Province of Quebec, 1895. Two copies. Dr. Elzear Pelletier.

Tenth Annual Report of the Pathological Library of the State Hospital for the Insane, Norristown, Penna., 1894. Charles W. Burr.

Silos and Silage, United States Department of Agriculture, Farmers' Bulletin No. 32. J. Sterling Morton.

Experiment Station Record, Washington, D. C., No. 3, Vol. VII.

Transactions Maine Medical Association. Vol. XII, Part I, 1895. Charles D. Smith.

Statistical Report of the Bureau of Health, Denver, Colorado, years 1892, '93, '94. Thomas F. Azpell.

Annual Report of the Board of Health of Toledo, Ohio, 1894. J. T. Woods, Health Officer.

Report of the Surgeon General of the U. S. M. H. Service to the Secretary of War, 1895. Walter Wyman.

Twelfth Annual Report of the Committee on Lunacy to the Board of Public Charities of Pennsylvania, 1894. Henry W. Wetherill.

Eighth Biennial Report of the Board of Health of the State of Iowa, 1895. J. F. Kennedy.

Maine Registration Report, 1893. A. G. Young, M. D.

Report of the Michigan State Board of Health, 1893. Eight copies. Henry B. Baker.

Transactions of the American Institute of Homoeopathy, Session 1895. Eugene H. Porter, M. A., M. D.

Report of the Board of Public Charities and Committee on Lunacy, 1894. Cadwalader Biddle.

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Report of Health Commissioner of St. Louis, 1895. George Homan, M. D.

Transactions Luzerne County Medical Society, 1895. Dr. Lewis H. Taylor.

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Text Book upon the Pathogenic Bacteria. McFarland. W. B. Saunders.

Report of the Provincial Board of Health, quarter ending December 31, 1895, Victoria B. C. A. T. Watt, M. D.

Ninth Annual Report of the Provincial Board of Health of New Brunswick, 1895. G. E. Coulthard.

Report of the Results Obtained with Experimental Filters at the Pettaconset Pumping Station of the Providence Water Works. Gardner T. Swartz, M. D.

Eleventh Biennial Report of the State Board of Health of Maryland, 1895. Dr. James A. Stewart.

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Eleventh Annual Report of the State Board of Health of Kansas, 1895. Dr. Thomas Kirkpatrick.

Weekly Abstracts of Sanitary Reports, 1895. Dr. Walter Wyman.

Proceedings of the Philadelphia County Medical Society, Vol. XVI, 1895. T. B. Schneideman, M. D.

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Fifteenth Annual Report of the State Board of Health of New York, 1895.

Maps Accompanying Fifteenth Annual Report of the State Board of Health of New York, 1895. Baxter T. Smeltzer. Two copies.

Nineteenth Report of the State Board of Health of New Jersey, 1895. Henry Mitchell, M. D.

Report of the Health Officer of the District of Columbia, 1895. William C. Woodward.

Biennial Report of the Board of Health of the State of Louisiana, 1894, '95. Will R. Harnan.

Pennsylvania Report of the Department of Agriculture, 1895. Thomas J. Edge.

Transactions State Medical Association of New York, 1895. E. D. Ferguson, M. D.

Transactions of the Pan-American Medical Congress. Vols. I, II, 1893. Two copies. Charles A. L. Reed.

Prevention of Tuberculosis, by James B. Russell. B. A., M. D., LL. D., Board of Health of Massachusetts.

Report of Bureau of Health of City of Denver, Colorado, 1895. William P. Munn.

Pennsylvania Geological Survey, 1895. Summary Final Report. Vol. III. Part 2. Atlas to Vol. III. Two copies. W. A. Ingham.

Pennsylvania Geological Survey, 1895. Summary Final Report.

Vol. III. Part 1. Index Final Summary Report, 1895. W. A. Ingham.

Report of the State Board of Health of Connecticut, 1895. C. A. Lindsley.

Forty-second Registration Report, Rhode Island, 1894. Gardner T. Swartz, M. D.

Bureau of Water, Philadelphia, Annual Report for 1895. Thomas M. Thompson.

Report of the State Board of Health of Michigan, 1894. Dr. Henry B. Baker.

Proceedings of the tenth and eleventh meetings of the National Conference of State Boards of Health of Washington, D. C., 1894, Chicago, Ill., 1896. Twenty copies. Dr. C. O. Probst.

Eighth Annual Report of the Department of Public Safety, Pittsburgh, Pa., 1895. Seven copies. Grosby Gray.

Report of the Ohio State Board of Health, 1895. Dr. C. O. Probst.

Annual Report of the Bureau of Health, Philadelphia. Abraham M. Beitler, Esq.

Manual of Health for use in Normal and Model Schools. Dr. Cassidy.

Annual Report Bureau of Health, 1895, Philadelphia. Two copies. John J. McKay.

Report of the State Board of Health of Massachusetts, 1895. S. W. Abbott.

#### Books Purchased.

Auto-Intoxication in Diseases. Bouchard Oliver.

Text Book upon Pathogenic Bacteria, McFarland. W. B. Saunders.

The American Year Book of Medicine and Surgery, Gould. W. B. Saunders.

English Sanitary Institutions. P. Blakiston, Son & Co.

Keil's Medical, Pharmaceutical and Dental Directory. Burk & McFetridge Co.

Medical and Surgical Register of the United States, fourth edition, 1896. R. L. Polk & Co.

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#### LIST OF JOURNALS AND BULLETINS.

---

Journal of the American Public Health Association. Subscription.

The Journal of the American Medical Association. Chicago, Ill. Subscription.

New England Medical Monthly. Danbury, Conn.

The Sanitarian. Brooklyn, N. Y. Subscription.

The Journal of Comparative Medicine and Veterinary Archives. Philadelphia, Pa. Subscription.

Buffalo Medical Journal. Buffalo, N. Y.

Public Health. Philadelphia. Subscription.

Medical and Surgical Reporter. Philadelphia, Pa.

Experiment Station Record. Washington, D. C.

Pennsylvania State College Bulletin. State College, Pa.

Tennessee State Board of Health Bulletin. Nashville, Tenn.

Official Monthly Report of the Department of Health, of Milwaukee, Wis. Milwaukee, Wis.

Report of the State Weather Bureau of Pennsylvania. Philadelphia, Pa.

Iowa State Board of Health Bulletin. Des Moines, Iowa.

Monthly Report of the Board of Health of Rochester, N. Y. Rochester, N. Y.

Official Monthly Report of the Bureau of Health of Denver, Colo. Denver, Colo.

Monthly Report of Department of Health. Buffalo, N. Y.

Weekly Report of Health Department of New York. New York, N. Y.

Weekly Returns of Births and Deaths in London, England. London, England.

The Sanitary Inspector. Official Bulletin of the State Board of Health of Maine. Augusta, Maine.

Quarterly Returns of Births, Deaths and Marriages of England and Wales. London, England.

Lehigh Valley Medical Magazine. Easton, Pa.

APPENDIX N.

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NINTH ANNUAL REPORT  
OF THE  
State Pharmaceutical Examining Board  
OF  
PENNSYLVANIA,  
FOR THE YEAR ENDING JUNE 30, 1896.

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Transmitted to the Governor January 9, 1897.

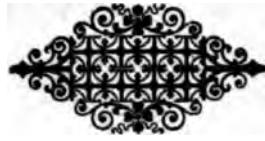
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Harrisburg, Pa., January 9, 1897.

To His Excellency, Daniel H. Hastings, Governor:

Sir: In compliance with the provisions of section 4 of the "Act to regulate the practice of pharmacy and sale of poisons, and to prevent the adulterations in drugs and medicinal preparations in the State of Pennsylvania," approved May 24, 1887, I have the honor to transmit the Ninth Annual Report of the Board for the year ending June 30, 1896.

Very Respectfully Yours,  
CHARLES T. GEORGE,  
Secretary.



MEMBERS OF THE BOARD.

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LOUIS EMANUEL, President, Pittsburgh, Pa.  
CHARLES T. GEORGE, Secretary, Harrisburg.  
HENRY C. PORTER, Treasurer, Towanda.  
EDWARD A. CORNELL, Williamsport.  
FELIX A. BOERICKE, M. D., Philadelphia.





## REPORT.

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The Board held four regular quarterly meetings during the year ending June 30, 1896.

The first meeting was held in the Central High School building at Williamsport, Pa., on Tuesday, July 23, 1895. Ninety applicants presented themselves for examination; sixty-one for registered pharmacists' certificates and twenty-nine for qualified assistants' certificates. Thirty-six of the former and twenty of the latter succeeded in passing the examination and were ordered to be registered.

The first session of the second quarterly meeting was held in the Central High School building, corner of Broad and Green streets, in the city of Philadelphia, on Saturday, October 19, 1895. One hundred and seventy-two persons presented themselves for examination, eighty-seven for registered pharmacists' certificates and eighty-five for qualified assistants' certificates; nine of the former and eighteen of the latter succeeded in passing the examination. The second session was held in the College of Pharmacy, city of Pittsburgh, on Monday, October 21, 1895. One hundred and eight persons presented themselves on examination; fifty-five for registered pharmacists' certificates and fifty-three for qualified assistants' certificates; eight of the former and nineteen of the latter succeeded in passing a successful examination.

The third quarterly meeting was held in the Central High School building, corner Broad and Green streets, in the city of Philadelphia, on Saturday, January 18, 1896. Two hundred and eighty-one persons presented themselves for examination, one hundred and twenty-eight for registered pharmacist certificates and one hundred and fifty-three for qualified assistants' certificates; forty-five of the former and seventy-three of the latter succeeded in passing the examination, and were ordered to be registered.

The first session of the fourth quarterly meeting of the Board was held in the College of Pharmacy, in the city of Pittsburgh, on April 15, 1896.

One hundred and ten persons appeared for examination. Forty-five for registered pharmacists' certificates and sixty-five for qualified assistants' certificates; seventeen of the former and thirty-eight of the latter succeeded in passing a successful examination.

The second session was held in the House of Representatives at Harrisburg, on Friday, April 17, 1896.

Two hundred and forty-six persons presented themselves for examination. One hundred and forty-six for registered pharmacists' certificates and one hundred for qualified assistants' certificates. Of this number, fifty-nine of the former and sixty-nine of the latter succeeded in passing the examination, and were ordered to be registered.

Total number examined during the year, 1,007. Of this number 411 succeeded in passing the examinations and were registered.

The annual report of the Treasurer of the Board, Mr. Henry C. Porter, of Towanda, Pa., showing a balance in his hands on July 1, 1896, of \$1,187.24, is herewith submitted.

Respectfully,

CHARLES T. GEORGE.

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Henry C. Porter, Treasurer, in account with the State Pharmaceutical Examining Board of Pennsylvania.

1895.	Debit.	
July 1. To balance on hand this date.....	\$998	16
July 23. To cash from C. T. George, Secretary...	282	00
Oct. 15. To Cash from C. T. George, Secretary..	344	00
Oct. 19. To cash from C. T. George, Secretary..	519	00
Oct. 21. To cash from C. T. George, Secretary..	324	00
Dec. 24. To cash from C. T. George, Secretary..	232	96
1896.		
Jan. 18. To cash from C. T. George, Secretary...	861	00
April 9. To cash from C. T. George, Secretary...	350	83
April 15. To cash from C. T. George, Secretary..	336	00
April 17. To cash from C. T. George Secretary..	750	00
July 3. To cash from C. T. George, Secretary...	799	17
		<hr/> \$5,797 12
1895.	Credit.	
October 15. By voucher No. 228. ....	\$197	35
October 16. By voucher No. 229. ....	150	85
October 16. By voucher No. 230.....	22	25
October 15. By voucher No. 231. ....	403	05
December 31. By voucher No. 232.....	187	88
1896.		
January 1. By voucher No. 233. ....	166	00

1895.	
January 1, By voucher No. 234, .....	\$143 00
December 31, By voucher No. 235, .....	198 93
December 31, By voucher No. 236, .....	15 00
1896.	
January 2, By voucher No. 237, .....	40 00
1895.	
December 31, By voucher No. 238, .....	232 96
December 31, By voucher No. 239, .....	25 00
1896.	
March 23, By voucher No. 240, .....	193 00
March 23, By voucher No. 241, .....	60 40
March 23, By voucher No. 242, .....	90 00
April 9, By voucher No. 243, .....	369 28
March 23, By voucher No. 244, .....	75 00
April 11, By voucher No. 245, .....	56 45
April 9, By voucher No. 246, .....	150 83
March 23, By voucher No. 247, .....	325 35
May 2, By voucher No. 248, .....	30 57
1895.	
October 29, By voucher No. 249, .....	206 00
1896.	
July 3, By voucher No. 250, .....	444 37
July 3, By voucher No. 251, .....	145 00
July 3, By voucher No. 252, .....	330 26
July 3, By voucher No. 253, .....	127 40
July 3, By voucher No. 254, .....	223 70
July 3, By cash balance on hand, .....	1,187 20
	<hr/> \$5,797 12

Condensed Statement of Expenditures of the State Pharmaceutical Examining Board of Pennsylvania from July 1, 1895, to July 3, 1896, inclusive.

Lawyers' fees, .....	\$305 44
Witnesses, court costs and expenses, .....	212 47
Detectives and expenses, .....	220 51
Chemist, .....	25 00
Printing, .....	469 85
Expenses, .....	22 85
Telegraph, .....	6 32
Postage, .....	133 80
Specimens, .....	40 00
Premiums, treasurer's bond (\$2,500.00), .....	18 75
Janitors and help, .....	95 25

Secretary's salary, railroad, hotel and incidental expenses, .....	1,502 14
Louis Emanuel, 94½ days' services,.....	472 50
Charles T. George, 60 days' service,.....	300 00
E. A. Cornell, 48 days' service,.....	240 00
F. A. Boericke, 19 days' services, .....	245 00
H. C. Porter, 60 days' services, .....	300 00
	<hr/>
	\$4,609 00

Respectfully submitted,  
**HENRY C. PORTER,**  
Treasurer.

Towanda, Pa., July 3, 1896.

### REGISTERED PHARMACISTS.

Abell, Wm. W., .....	Third and York streets, ..	Philadelphia.
Aber Leonidas, .....	White Ash, .....	Allegheny county.
Achey, Frederick A., ....	East Petersburg, .....	Lancaster county.
Achre Cyrus J.,.....	Greenville, .....	Mercer county.
Acker, Louis K., .....	1806, Carson street, .....	Pittsburg.
Ackerman, A. K., .....	Turbotville, .....	Nothumberland county.
Acomb, James L., .....	Tidioute, .....	Warren county.
Adams, Frank A., .....	153 East Sixteenth street, ..	Erie.
Adams, James D., .....	Tenth and Spruce, .....	Philadelphia.
Adams, W. Scott, .....	428 North Fifth street, ...	Reading.
Adamson, Thomas H., ....	Cochrannton, .....	Crawford county.
Addis, Simon D., .....	East Third street, .....	South Bethlehem.
Agnew, Edwin I., .....	Wampum, .....	Lawrence county.
Agrellus, John W., .....	Youngsville, .....	Warren county.
Aicken, Otto C., .....	1616 Sassafras street, .....	Erie.
Alken, Albert J.,.....	213 Fisk street, .....	Pittsburg.
Alken, James, .....	Berwin, .....	Chester.
Alsblitt, Matthews S., ....	181 Centre street, .....	Pittsburg.
Aitken, John W., .....	Carbondale, .....	Lackawanna county.
Aitken, R. Barclay, .....	Bart, .....	Lancaster county.
Aitken, T. Benton, .....	West Chester, .....	Chester county.
Akers, Frank L., .....	1106 Eleventh street, .....	Altoona.
Albaugh, Herbert S., ....	2200 N. 15th St., .....	Philadelphia.
Albright, Franklin P., ....	720 Berks street, .....	Philadelphia.
Aldenderfer, Chas. D., ....	3610 Fifth avenue, .....	Pittsburg.
Aldinger, C. D., .....	Butler, .....	Butler county.
Alexander, Chas. E., ....	York, .....	York county.

Alexander, Wm. A.,	..... Everett,	..... Bedford county.
Alexander, Wm. B.,	..... Reynoldsville,	..... Jefferson county.
Alleman, Emanuel A.,	.... West Milton,	..... Northumberland county.
Alleman, Frank,	..... 233 West Chestnut street,	.. Lancaster.
Allen, Edward S.,	..... 1401 South Canal street,	.. Sharpsburg.
Allen, J. H.,	..... 7th Ave., and 7th St.,	..... Altoona.
Allis, Irving M.,	..... Wyalusing,	..... Bradford county.
Allison, Elmer W.,	..... Indiana,	..... Indiana county.
Allison, Robert L.,	..... Butler,	..... Butler county.
Allison, Robert W.,	..... Wilkinsburg,	..... Allegheny county.
Alsentzer, Chas. F.,	..... Thurlow,	..... Delaware county.
Althouse, Frank J.,	..... 9 North Thirteenth street,	Harrisburg.
Alter, Geo. W.,	..... Blairsville,	..... Indiana county.
Altman, Wm. H.,	..... Belleville,	..... Mifflin county.
Ames, Newton F.,	..... Corry,	..... Erie county.
Amick, John H. B.,	..... 2059 N. 13th St.,	..... Philadelphia.
Ancona, Chas. P.,	..... Pottstown,	..... Montgomery county.
Ancona, Edward P.,	..... Pottstown,	..... Montgomery county.
Ancker, Louis,	..... 1410 Chestnut street,	..... Philadelphia.
Anderson, Geo. H.,	..... Monongahela City,	..... Washington county.
Anderson, Harry C.,	..... Manayunk,	..... Philadelphia.
Andes, John B.,	..... Honey Brook,	..... Chester county.
Andrews, Geo. W.,	..... Fawn Grove,	.....
Andriessen, Fred.,	72 Federal street,	..... Allegheny.
Andriessen, Hugo,	..... Beaver,	..... Beaver county.
Angle, Jay W.,	..... Eighth and Green streets,	Philadelphia.
Angney, Joseph S., Jr.,	... Ambler,	.....
Angney, Wm. M.,	..... 519 Spruce street,	..... Philadelphia.
Anhalt, Herman,	..... 1616 Columbia avenue,	..... Philadelphia.
Anspach, Paul B.,	..... Easton,	..... Northampton county.
Anthes, Phillip,	..... 101 Fourth avenue,	..... Pittsburg.
Anthony, Will R.,	..... Indiana,	..... Indiana county.
Antill, Joseph V.,	..... 2300 North Fifth street,	..... Philadelphia.
Anwyl, James W.,	..... Wilkes-Barre,	..... Luzerne county.
Appeldorn, Ernest F.,	.... 2113 Howard street,	..... Philadelphia.
Appenzeller, Geo. W.,	.... 1123 Colona street,	..... Philadelphia.
Appenzeller, Gustav,	.... 530 South Eleventh street,	Philadelphia.
Apple, Ammon A.,	..... 2303 North Second street,	..... Philadelphia.
Apple, Franklin M.,	..... 2401 North Seventh street,	Philadelphia.
Archibald, Henry C.,	..... 1321 South Sixth street,	..... Philadelphia.
Armor, Alpheus,	..... 57 Taylor avenue,	..... Allegheny.
Armstrong, Alvin B.,	.... Smethport,	..... McKean county.
Armstrong, Benjamin,	.... 137 North Franklin street,	Wilkes-Barre.
Armstrong, Clinton O.,	.. Millford,	..... Pike county.
Armstrong, Eugene C.,	.... 2021 N. 20 St.,	..... Philadelphia.
Armstrong, Geo. B.,	..... Troy,	..... Bradford county.
Armstrong, James, Jr.,	... Greensburg,	..... Westmoreland county.
Armstrong, John C.,	..... Waynesville,	..... Fayette county.
Armstrong, Joseph D.,	... Brownsville,	..... Fayette county.
Armstrong, Neri,	..... Carmichaels,	..... Greene county.
Armstrong, Wm. K.,	.... Bloomsburg,	..... Columbia county.
Arnold, Annie B.,	..... 1601 Sixth street,	..... Harrisburg.
Arnold, Calvin, M.,	..... 1601 Sixth street,	..... Harrisburg.

Arnold, Henry P.,	3928 Market street,	Philadelphia.
Arnold, Jacob A.,	Houtzdale,	Clearfield county
Asann, Godfrey,	1311 Dorrance street,	Philadelphia.
Aschenbach, Frederick,	Third and Collowhill Sts.,	Philadelphia.
Ashton, Chas. B.,	431 Arch street,	Norristown.
Ashmead, Alfred C.,	1041 Walnut street,	Philadelphia.
Ashmead, Anna S.,	Tioga,	Philadelphia.
Ashmead, Benj. P.,	900 Gray's Ferry Road,	Philadelphia.
Ashmead, Thomas E.,	1041 Walnut street,	Philadelphia.
Aston, Ernest E.,	387 North Main street,	Wilkes-Barre.
Aszmann, Louise H.,	4401 Market street,	Philadelphia.
Atkins, Frank H.,	1106 Girard street,	Philadelphia.
Atkinson, Andrew J.,	Lewistown,	Mifflin county.
Aubley Samuel,	Scottdale,	Westmoreland county.
Aughinbaugh, Geo. W. Jr.,	233 North Second street,	Philadelphia.
Avery, L. B.,	Centremoreland,	Wyoming county.
Babbitt, C. O.,	Corry,	Erle county.
Babbitt, Franklin T.,	Corry,	Erle county.
Babcock, Wm. C.,	Blossburg,	Tioga county.
Bachman, Chas. L.,	109 South Third street,	Easton.
Bachmann, Carl F.,	51 Liberty street,	Allegheny.
Backinstoe, Harry F.,	1021 Girard avenue,	Philadelphia.
Backman, Edward F.,	767 South Ninth street,	Philadelphia.
Baer, Hermanus L.,	Somerset,	Somerset county.
Baer, Jacob M.,	1400 Spruce street,	Philadelphia.
Bahl, Chas. H.,	1002 North Sixth street,	Philadelphia.
Bahl, Chas. Z.,	1002 North Sixth street,	Philadelphia.
Bailey, Arthur H.,	126 Locust street,	Harrisburg.
Bailey, Elmer E.,	3111 Arizona street,	Philadelphia.
Bailey, Henry T.,	1615 Huntingdon street,	Philadelphia.
Bailey, John H.,	241 North Twelfth street,	Philadelphia.
Baird, David R.,	Johnstown,	Cambria county.
Baird, John R.,	Brockwayville,	Jefferson county.
Baker, A. M.,	Blairsville,	Indiana county.
Baker, George F.,	3100 North Sixteenth St.,	Philadelphia.
Baker, Henry T.,	Warren,	Warren county.
Baker, John G.,	1403 North Front street,	Philadelphia.
Baker, John J., Jr.,	White Haven,	Luzerne county.
Baker, Nellie,	West Grove,	Chester county.
Baker, Sylvester J.,	528 Arch street,	Philadelphia.
Baker, Theodore W.,	Norristown,	Montgomery county.
Baker, Thomas D.,	Lewisburg,	Union county.
Baker, Wm. K.,	12th Ave., and 12 St.,	Altoona.
Balbirnie, H. H. D.,	276 South Third street,	Philadelphia.
Baldwin, Thomas D.,	Third and Hepford,	Williamsport.
Ball, Ellwood,	Hellertown,	Northampton county.
Ball, Wm. E.,	Hellertown,	Northampton county.
Ballinger, A. L.,	Meadville,	Crawford county.
Baph, J. F.,	Butler,	Butler county
Banks, Lucian,	Mifflintown,	Juniata county.
Banks, Wm. B.,	736 N. 13th St.,	Philadelphia.
Banks, Wm. H.,	Mifflintown,	Juniata county.
Banner, Peter L.,	Verona,	Allegheny county.

Barber, Harry L.,	2200 Franklin street,	Philadelphia.
Barber, Peter M.,	West Pittston,	Luzerne county.
Barker, James H.,	160 Robinson street,	Allegheny.
Bardment, Philip L.,	2632 North Seventh street,	Philadelphia.
Barlow, Louis E.,	3100 Richmond street,	Philadelphia.
Barnard, Chas. H.,	Ashland,	Schuylkill county.
Barndollar, Wm. L.,	196 Beaver street,	Allegheny.
Barndt, S. K.,	Alburtis,	Lehigh county.
Barnett, James A.,	Springdale,	Allegheny county.
Barnett, Marlon D.,	McKeesport,	Allegheny county.
Barnitz, John S.,	21 North Main street,	Chambersburg.
Barr, David Ford,	1801 Master street,	Philadelphia.
Barr, J. Rufus,	West Conshocken,	Montgomery county.
Barr, Theodore A.,	Pinegrove,	Schuylkill county.
Barrett, Charles L.,	4029 Spring Garden street,	Philadelphia.
Barron, Chas. A.,	Shamokin,	Northumberland county.
Barrowman, Thomas,	1535 Washington avenue,	Scranton.
Bartges, Aaron L.,	Loganton,	Clinton county.
Barth, Frederick C.,	424 Fairmount avenue,	Philadelphia.
Barth, Joseph H.,	144 Thirty-eighth street,	Pittsburg.
Bartho, Benj. F.,	Mt. Carmel,	Northumberland county.
Bartleson, Chas. L.,	Clifton Heights,	Delaware county.
Bartlett, H. S.,	2324 North Carlisle street,	Philadelphia.
Barton, George W.,	2314 Chestnut street,	Philadelphia.
Barton, Theodore W.,	Waterford,	Erle county.
Barwig, Gustav A.,	2024 North Second street,	Philadelphia.
Baskin, M. H.,	1233 Race street,	Philadelphia.
Baskin, Mortimer H.,	1001 North Seventh street,	Harrisburg.
Batdorff, H. James,	2267 North Sixteenth St.,	Philadelphia.
Bateman, Mary H.,	Shousetown,	Allegheny
Bateman, Wm. H. T.,	548 Perkiomen street,	Philadelphia.
Bauer, George L.,	747 Holly street,	Philadelphia.
Bauer, Louis G.,	Fifth and Fairmount Ave.,	Philadelphia.
Baume, Frank D.,	2114 N. 32d St.,	Philadelphia.
Baumeister Joseph F.,	Scranton,	Lackawanna county.
Baumgardner, Chas. B.,	1617 Eighth avenue,	Altoona.
Baur, Wm.,	St. Clair,	Schuylkill county.
Bayard, Walter B.,	1432 York street,	Philadelphia.
Beach, Clifton H.,	Ashinwall,	Allegheny county.
Beach, George B.,	1125 Washburn street,	Scranton.
Beach, Wm. S.,	2136 Fifth avenue,	Pittsburg.
Beach, Wm. T.,	Minersville,	Schuylkill county.
Beagell, W. H.,	Homestead,	Allegheny county.
Beal, Levi C.,	Uniontown,	Fayette county.
Beal, Mrs. Mollie,	Uniontown,	Fayette county.
Beale, Benjamin,	602 South Second street,	Philadelphia.
Beale, Edmund,	602 South Second street,	Philadelphia.
Beam, Frank,	116 Fifth avenue,	McKeesport
Beamer, Wm. J.,	Manor Station,	Westmoreland county.
Bear, John H.,	Mt. Joy,	Lancaster county.
Beatty, John,	Frankford,	Philadelphia.
Beaver, Samuel,	Annaville,	Lebanon county.
Bebout, John J.,	Bellevue,	Allegheny county.



Bebout, Wm. J.,	Darlington,	Beaver county.
Bechtel, Joseph Y.,	Schwenksville,	Montgomery county.
Bechtold, Mrs. Elizabeth,	942 Susquehanna avenue,	Philadelphia.
Bechtold, Thomas B.,	942 Susquehanna avenue,	Philadelphia.
Beck, Addison L.,	Sharon,	Mercer county.
Beck, Adolph,	52 South Twelfth street,	Pittsburg.
Beck, Althouse, P.,	237 Ohio street,	Allegheny.
Beck, John,	1001 Wylie avenue,	Pittsburg.
Beck, Robert W.,	Sharpsville,	
Beck, Wm. L.,	2508 Wylie avenue,	Pittsburg.
Beckett, Josiah B.,	Lansdowne,	Delaware county.
Becker, Arwin A.,	507 North Seventh street,	Philadelphia.
Beckley, Geo. A.,	12th Ave., and 12th St.,	Altoona.
Beckley, James P.,	947 Penn avenue,	Pittsburg.
Bedford, Sterling,	Waverly,	Lackawanna county.
Beers, Benjamin F.,	142 Stanton street,	Wilkes-Barre.
Beldler, Samuel M.,	1536 North Fourth street,	Philadelphia.
Beighley, Wm. A.,	Blairsville,	Indiana county.
Belcher, C. E.,	Morrisdale Mines,	Clearfield county.
Bell, Perry A.,	2154 Wylie avenue,	Pittsburg.
Bell, Wm.,	19th and Wharton streets,	Philadelphia.
Bell, Wm. B., Jr.,	19th and Wharton streets,	Philadelphia.
Belman, Samuel L.,	4755 Butler street,	Pittsburg.
Bender, Abner S.,	240 Main street,	Pittsburg.
Bender, Edward A.,	4099 Lancaster avenue,	Philadelphia.
Bender, George H.,	Jonestown,	Lebanon county.
Bender, John Jacob,	1637 North Eighteenth St.,	Philadelphia.
Bender, Wm. P., Jr.,	18th and Morris streets,	Philadelphia.
Benedict, Wm. P.,	289 East Wheeling street,	Washington.
Benjamin, Samuel N.,	704 Monroe avenue,	Scranton.
Benn, Wallace B.,	First and Talbot avenue,	Braddock.
Benner, Isaac,	71st and Woodland avenue,	Philadelphia.
Bennett, Ashton D.,	Mahaffey,	Clearfield county.
Bennett, Calvin W.,	Wilkes-Barre,	Luzerne county.
Bennett, Francis G.,	Mahaffey,	Clearfield county.
Bennett, Irwin E.,	3726 Market street,	Philadelphia.
Bensinger, Geo. I.,	Schuylkill Haven,	Schuylkill county.
Bentley Percival W.,	764 West Fourth street,	Williamsport.
Berg, Leroy	63 Public Square,	Wilkes-Barre.
Berger, Carlton D.,	Pottsgrove,	Northumberland county.
Bergner, Carl F. G.,	950 Penn street,	Reading.
Beringer, Geo. M.,	528 Arch street,	Philadelphia.
Berkstresser, W. J.,	Kennett Square,	Chester county.
Berlin, Chas. S.,	Coudersport,	Potter county.
Berlin, James O.,	Bath,	Northampton county.
Bernardy, Emile S.,	221 South Eleventh st.,	Philadelphia.
Berry, Chas. L.,	401 Franklin street,	Johnstown.
Berryhill, Henry P.,	Connellsville,	Fayette county.
Beshore, Ellsworth S.,	Pottstown,	Montgomery county.
Besore, Abraham L.,	Shippensburg,	Cumberland county.
Best, Austin,	723 South Nineteenth St.,	Harrisburg.
Bethel, Bennett N.,	632 North Eighteenth St.,	Philadelphia.
Betts, T. Everett,	36th and Wallace streets,	Philadelphia.

Betz, Wm. Howard, .....	1541 Fountaine street, .....	Philadelphia.
Benter, John, .....	619 Seventh avenue, .....	Beaver Falls.
Beyer, John J., .....	Fifth and Norris streets, .....	Philadelphia.
Beyer, Joseph M., .....	Punksutawney, .....	Jefferson county.
Bichy, Wm., .....	6819 Germantown avenue, .....	Philadelphia.
Bickel, Harry L., .....	1412 Walnut street, .....	Philadelphia.
Bickley, Milton H., .....	Chester, .....	Delaware county.
Bickley, Mortimer H., ....	Chester, .....	Delaware county.
Bicknell, Robert C., .....	254 South Ninth street, ...	Philadelphia.
Blery, Wm. F., .....	Weissport, .....	Carbon county.
Blever, John A., .....	417 Twenty-second street, ..	Lebanon.
Bigony, Lorenzo S., .....	Lansdale, .....	Montgomery county.
Bilderback, J. B., .....	1201 Chestnut street, .....	Philadelphia.
Bille, George, .....	2300 Oxford street, .....	Philadelphia.
Billlich, Harvey T., .....	Courtney, .....	Washington county.
Billings, F. T., .....	Le Raysville, .....	Bradford county.
Billings, Geo. E., .....	Le Raysville, .....	Bradford county.
Billings, Irving W., .....	Nicholson, .....	Wyoming county.
Billstein, Nicolaus, .....	1501 Potter street, .....	Chester.
Bimber, George L., .....	2513 Carson street, .....	Pittsburg.
Bing, Edward W., .....	Chester, .....	Westmoreland county.
Bingham, Frank O., ....	Suterville, .....	Delaware county.
Binwey, George K., .....	Orwigsburg, .....	Schuylkill county.
Birch, Benjamin J., .....	Greensboro, .....	Greene county.
Birch, Margaret D., ....	Port Carbon, .....	Schuylkill county.
Birch, Thomas J., .....	Port Carbon, .....	Schuylkill county.
Birchard, Chas. F., .....	Ellwood City, .....	Lawrence county.
Birchard, E. L., .....	Cambridgeboro, .....	Crawford county.
Birchard, Henry C., ....	Ellwood City, .....	Lawrence county.
Bird, Wellington H., .....	1106 Chestnut street, .....	Philadelphia.
Birmingham, L. Z., ....	California, .....	Washington county.
Bischoff, Louis J., .....	64 Troy Hill street, .....	Allegheny.
Bitler, Harry, .....	134 North Ninth street, ..	Reading.
Bittner, Frederick C., ...	403 North Ninth street, ...	New Kensington.
Bixler, Samuel H. C., .....	Greencastle, .....	Franklin county.
Blachly, Frank L., .....	Clarksville, .....	Greene county.
Blachly, H. S., .....	Waynesburg, .....	Greene county.
Back, Jacob H., .....	Huntingdon, .....	
Black, James B., .....	Coultersville, .....	Allegheny county.
Black, John, .....	German and Church sts., ..	Lancaster.
Black, Wm. M., .....	Boston, .....	Allegheny county.
Blackburn, Dewees S., ...	5140 Liberty avenue, ....	Pittsburg.
Blackburn, Robert P., ...	1172 West Fourth street, ..	Williamsport.
Blackman, A. S., .....	12 North Main street, ....	Wilkes-Barre.
Blackmon, Clarence S., ...	Greenville, .....	Mercer county.
Blackwood, Russell T., ...	15th and Thompson sts., ..	Philadelphia.
Blair, Andrew, .....	1801 Chestnut street, ....	Allegheny.
Blair, Chas. C., .....	266 North street, .....	Harrisburg.
Blair, Geore, .....	Corry, .....	Erie county.
Blair, Henry C., .....	800 Walnut street, .....	Philadelphia.
Blair, Henry C., 3d, .....	800 Walnut street, .....	Philadelphia.
Blair, John S., .....	Corry, .....	Erie county.
Blair, Mary E., .....	West Elizabeth, .....	Allegheny county.

Blair, Wm. H.,	Adamsville,	Crawford county.
Blesse, Wm. J.,	Baden,	Beaver county.
Bligh, Angle E.,	Conneaut Lake,	
Bligh, Leon E.,	Grove City,	Mercer county.
Bligh, Wm. D.,	Conneaut Lake,	
Blithe, Henry,	3212 Market street,	Philadelphia.
Bloes, W. S.,	Peckville,	Lackawanna county.
Blomer, George,	6th and Dickinson streets,	Philadelphia.
Blomer, George, Jr.,	6th and Dickinson streets,	Philadelphia.
Blood, Roswell P.,	Brookville,	Jefferson county.
Bloom, Erasmus S.,	602 Arch street,	Philadelphia.
Blouch, Chas. H.,	521 Cumberland street,	Lebanon.
Blough, H. K.,	Ellizabethtown,	Lancaster county.
Bobb, Henry,	East Greenville,	Montgomery county.
Bocking, Gindo C.,	Tyrone,	Blair county.
Bodenhorn, Adam,	Hamburg,	Berks county.
Boericke, Felix A.,	1204 Dauphin street,	Philadelphia.
Boger, Chas. E.,	Lebanon,	
Boher, Jay H.,	205 Market street,	Harrisburg.
Bohn, Chas. H.,	2d and Poplar streets,	Philadelphia.
Bolar, Harry W.,	Homer City,	Indiana county.
Bollinger, Chas. W.,	Apollo,	
Bolton, Alfred H.,	Chelten and Chew streets,	Germantown.
Boltz, Elias K.,	209 South Tenth street,	Philadelphia.
Bond, Chas. E.,	1609 Dickinson avenue,	Scranton.
Bond, Harry C.,	Tamaqua,	Schuylkill county.
Bond, Ira L.,	Tamaqua,	Schuylkill county.
Bond, John T.,	Tamaqua,	Schuylkill county.
Bond, Wm. L., Jr.,	627 Smithfield street,	Pittsburg.
Bonnett, Wm. H.,	Brookville,	Jefferson county.
Bonney, Water P.,	361 West Seventh street,	Erie.
Bonnell, A. C.,	Riegelsville,	Bucks county.
Boone, Geo. H.,	Avoca,	Luzerne county.
Boone, H. M.,	Pottstown,	Montgomery county.
Boose, Wm. E.,	430 West King street,	York.
Booth, Nelson A.,	Bentleyville,	Washington county.
Borchert, Wm. H.,	10th and Jefferson street,	Philadelphia.
Borden, Wm. M.,	Columbia,	Lancaster county.
Borell, Henry A.,	2043 Chestnut street,	Philadelphia.
Boring, Edwin M.,	933 Fairmount avenue,	Philadelphia.
Borland, Wm. J.,	Uniontown,	Fayette county.
Borneman, Joseph H.,	Boyertown,	Berks county.
Bosch, Maximillian,	1314 Parade street,	Erie.
Bossert, Henry,	335 East Market street,	Wilkes-Barre.
Bossler, David J.,	2856 Germantown avenue,	Philadelphia.
Bostick, Elmer E.,	2047 E. Cumberland St.,	Philadelphia.
Boswoyth, Chas. H.,	Osceola,	Tloga county.
Bott, Harry F.,	Pittsburg,	Allegheny county.
Boush, Albert L.,	Market and Chestnut Sts.,	Meadville.
Bouton, F. M.,	Adams Ave., and Pine St.,	Scranton.
Bovard, George W.,	Tionesta,	Forest county.
Bowen, George W.,	1500 Cumberland street,	Philadelphia.
Bowen, Wm. M.,	New Market & Brown Sts.,	Philadelphia.

Bower, Addison, .....	Myerstown, .....	Lebanon county.
Bower, Andrew, .....	Sabinsville, .....	Tioga county.
Bowers, Augustus, .....	Prospect, .....	Butler county.
Bowers, Chas. E., .....	Middletown, .....	Dauphin county.
Bowers, Luther P., .....	1103 Ridge avenue, .....	Philadelphia.
Bowker, Frank, .....	29th and Ridge avenue, ..	Philadelphia.
Bowman, David B., .....	West Chester, .....	Chester county.
Bowman, Mrs. E. R., .....	Girard, .....	Erie county.
Bowman, Geo. M., .....	3526 Haverbord avenue, ..	Philadelphia.
Bowman, Henry C., .....	Mahanoy City, .....	Schuylkill county.
Bowman, John M., Jr., ...	13th and Lombard Sts., ..	Philadelphia.
Bowman, Maurice W., ....	Royersford, .....	Montgomery county.
Bowman, Wm. Frank, ....	333 South Thirteenth St.,	Reading.
Boyd, Chas. N., .....	Butler, .....	Butler county.
Boyd, Guy H., .....	19 South George street, ...	York.
Boyd, Isaac M., .....	Goldsboro, .....	York county.
Boyer, Edward L., .....	127 South Fourth street, ..	Philadelphia.
Boyer, Franklin N., .....	35 South Fourth street, ...	Reading.
Boyer, Geo. C., .....	Plains, .....	Luzerne county.
Boyer, J. H., .....	Mechanicsburg, .....	Cumberland county.
Boyer, Wallace, .....	Main and Swede streets, ..	Norristown.
Boyle, R. Raum, .....	1500 North Second street, .	Philadelphia.
Boyles, C. J. C., .....	119 North Eleventh street,	Philadelphia.
Boyles, Robert M., .....	Falls Creek, .....	
Bradenbaugh, R. B., .....	Millersburg, .....	Dauphin county.
Bradford, John M., .....	801 West Cumberland St., ..	Philadelphia.
Brady, Harry F., .....	2142 Marston street, .....	Philadelphia.
Brady, John D., .....	11 Boggs avenue, .....	Pittsburg.
Brady, John T., .....	Honesdale, .....	Wayne county.
Bragg, James W., .....	Pittston, .....	Luzerne county.
Brandt, Irwin J., .....	531 Penn street, .....	Reading.
Brant, Chas. W., .....	19 South George street, ..	York.
Brant, Robert P., .....	Shanksville, .....	Somerset county.
Brashear, Fred. L., .....	Franklin, .....	Venango county.
Braun, Edward L., .....	286 Western avenue, .....	Allegheny.
Braun, Frederick L., .....	286 Western avenue, .....	Allegheny.
Brechbill, McClellan, ....	Leechburg, .....	Allegheny county.
Brehm, F. J. L., .....	624 Smithfield street, ....	Pittsburg.
Brehm, Louis, .....	624 Smithfield street, ....	Pittsburg.
Breisch, Wm. H., .....	Kingston, .....	Luzerne county.
Brellocks, Fred'k J., .....	2643 N. 27th St., .....	Philadelphia.
Breneman, M. B., .....	Saxton, .....	Bedford county.
Brennan, F. H., .....	732 Norris street, .....	Philadelphia.
Brennan, Henry M., .....	Addingham, .....	Delaware county.
Brenneman, Geo. M., ....	York, .....	York county.
Brenneman, Jesse B., ....	York, .....	York county.
Brensinger, Ellen C., ....	2532 Columbia avenue, ....	Philadelphia.
Brent, Raymond D., .....	3621 Fifth avenue, .....	Pittsburg.
Brewster, Isaac W., .....	521 Franklin avenue, ....	Wilkesburg.
Brewster, Mrs. M. A., ....	1011 Carson street, .....	Pittsburg.
Brewster, Wm. N., .....	2722 E. Somerset street, ..	Philadelphia.
Bridger, Paul, .....	745 Spring Garden street, .	Philadelphia.
Briesenick, Chas. W., ....	Whitney, .....	

Briggs, Jacob F.,	.....	Lehigh county.	Luzerne county.
Bright, Wilford M.,	.....	Frackville,	Schuylkill county.
Bright, Wm. W.,	.....	Watson town,	Northumberland county.
Britcher, Milton W.,	.....	Dillsburg,	York county.
Brittain, John,	.....	Rochester,	Allegheny county.
Brobeck, C. P.,	.....	196 Beaver avenue,	Beaver county.
Brobst, J. C.,	.....	Lititz,	Lancaster county.
Brockley, Joseph,	.....	Hanover,	York county.
Brockman, F. W.,	.....	470 East Market street,	York.
Brodhead, Edgar A.,	.....	Kittanning,	Armstrong county.
Brodhead, Wm. F.,	.....	Kittanning,	Armstrong county.
Brodie, Robert C.,	.....	20th and Callowhill streets,	Philadelphia.
Brooks, Joseph W.,	.....	Pensauken,	New Jersey.
Brooks, Mitchell B.,	.....	824 South Fourth street,	Philadelphia.
Brooks, Raymond R.,	.....	Miles Grove,	Erie county.
Brown, Alonzo L.,	.....	Belle Vernon,	Fayette county.
Brown, Anthony P.,	.....	825 Capouse avenue,	Scranton.
Brown, Arthur G.,	.....	Wyalusing,	Bradford county.
Brown, B. Levi,	.....	935 Arch street,	Philadelphia.
Brown, Chas. W.,	.....	Belle Vernon,	Fayette county.
Brown, Clark W.,	.....	Lindsey,	
Brown, Edward H.,	.....	Wells,	Bradford county.
Brown, Eugene L.,	.....	Beaver,	Beaver county.
Brown, Frank L.,	.....	400 West Main street,	Norristown.
Brown, F. Wigton,	.....	Concordville,	Delaware county.
Brown, Geo. B. W.,	.....	Titusville,	Crawford county.
Brown, Geo. R.,	.....	Kittanning,	Armstrong county.
Brown, Geo. W.,	.....	21 Park Row,	Erie.
Brown, Henry,	.....	333 Emmett street,	Scranton.
Brown, Homer,	.....	40 Seventh avenue,	Pittsburg.
Brown, James, A.,	.....	225 North Duke street,	Lancaster.
Brown, James L.,	.....	Pleasant Unity,	Westmoreland county.
Brown, James R. L.,	.....	Second and Locust streets,	Columbia.
Brown, John K.,	.....	Port Carbon,	Schuylkill county.
Brown, John S.,	.....	Stroudsburg,	Monroe county.
Brown, Otis S.,	.....	Russell,	Warren county.
Brown, Samuel P.,	.....	Greensburg,	Westmoreland county.
Brown, Thomas D.,	.....	16th and Thompson Sts.,	Philadelphia.
Brown, W. T. J.,	.....	Oxford,	Chester county.
Brownley, Chas. J.,	.....	4202 Lancaster avenue,	Philadelphia.
Brubaker, A. M.,	.....	Goodville,	Lancaster county.
Brubaker, Edwin S.,	.....	New Brighton,	Beaver county.
Bruce, Wm. T.,	.....	835 Willow street,	Lebanon.
Bruckmann, Fred'd,	.....	211 Brushtown,	
Brugh, P. S.,	.....	Columbia,	Lancaster county.
Bruhns, Julius,	.....	725 South Clearfield street,	Philadelphia.
Brumhouse, Fred'k Jr.,	.....	321 West Market street,	York.
Bryson, Lewis,	.....	Paradise,	Lancaster county.
Buchanan, A. Stein,	.....	Chester,	Delaware county.
Bucher, Wm. Lewis,	.....	Columbia,	Lancaster county.
Buchholt, Chas. R.,	.....	McDonald,	Washington county.
Buchholz, Wm. M. G.,	.....	1801 Centre avenue,	Pittsburg.
Buck, Will G.,	.....	Shamokin,	Northumberland county.

Buckhart, Herman A.,	... Bethlehem,	Northampton county.
Buckingham, H. W.,	... Kylertown,	Clearfield county.
Buckley, L. Edward,	... Ward,	Delaware county.
Buckman, James,	... 8th and Green Sts.,	Philadelphia.
Buckman, Thos L.,	... Chestnut Hill,	Philadelphia.
Buckwalter, Irwin M.,	... Phoenixville,	Chester county.
Buehler, David A.,	... 1711 Summer street,	Philadelphia.
Buehler, L. M.,	... Gettysburg,	Adams county.
Bulger, Howard H.,	... Brownsville,	Fayette county.
Bullock, Charles,	... 528 Arch street,	Philadelphia.
Bullock, John G.,	... 528 Arch street,	Philadelphia.
Bullock, Thos. H.,	... West King and Pine Sts.,	Lancaster.
Bullock, Wm. A.,	... 528 Arch street,	Philadelphia.
Bundel, Chas. E.,	... Sharon,	Mercer county.
Bundel, Grace,	... Sharon,	Mercer county.
Bundy, Clinton T.,	... 146 North Twentieth St.,	Philadelphia.
Bunker, Wm. B.,	... 15th and Arch Sts.,	Philadelphia.
Bunting, Frank A.,	... 514 West Main street,	Philadelphia.
Burdick, A. W.,	... Carbondale,	
Burg, John D.,	... Fourth and Brown streets,	Philadelphia.
Burgoon, Wm. H.,	... 1322 Tenth avenue,	Altoona.
Burk, Alfred G.,	... Sixth and Arch streets,	Philadelphia.
Burk, Wm. B.,	... Sixth and Arch streets,	Philadelphia.
Burke, Sylvester L.,	... Lowellville,	Ohio.
Burke, Wm. T.,	... 11th St., and Girard Ave.,	Philadelphia.
Burkett, Geo. G.,	... East Hickory,	Forest county.
Burnham, Dewitt C.,	... Mansfield,	Tioga county.
Burns, Andrew B.,	... Montrose,	Susquehanna county.
Burns, Geo. C.,	... Montrose,	Susquehanna county.
Burns, Howard W.,	... Coraopolis,	Allegheny county.
Burns, John K.,	... Minersville,	Schuylkill county.
Burns, Wm. A.,	... 1130 Spring Garden street,	Philadelphia.
Burns, Willoughby P.,	... Nanticoke,	Luzerne county.
Burt, Andrew	... Tamaqua,	Schuylkill county.
Burton, Robert J.,	... 1306 Girard avenue,	Philadelphia.
Bush, Harry B.,	... 409 North Main street,	Bethlehem.
Bush, Horace,	... East Stroudsburg,	Monroe county.
Buskirk, James Van,	... 2303 North Second street,	Philadelphia.
Buss, Milton M.,	... South Bethlehem,	Northampton county.
Bussler, Royal H.,	... Williamsport,	Lycoming county.
Butler, John P.,	... 8th Ave., and 12th St.,	Altoona.
Butt, Abijah W.,	... Paoli,	Chester county.
Butz, A. S.,	... 4202 Lancaster avenue,	Philadelphia.
Butz, Newton,	... Eighth and Race streets,	Philadelphia.
Buzard, Albert M.,	... Kylertown,	Montgomery county.
Byerly, Chas. H.,	... 7225 Woodland avenue,	Philadelphia.
Byerly, Milton R.,	... 1606 Park avenue,	
Byers, Hinzling C.,	... Pottstown,	Montgomery county.
Byers, Robert E.,	... Monongahela City,	Washington county.
Byers, Wm. C.,	... 418 Sixth avenue,	Pittsburg.
Byers, Wm. C.,	... 66 Sixth avenue,	Pittsburg.
Byrne, Edward T.,	... Chester,	Delaware county.
Cable, Albert,	... 203 West Market street,	Pottsville.

Cadmus, Robert C.,	2100 Mt. Vernon street,	Philadelphia.
Cain, Albert W.,	Elizabethtown,	Lancaster county.
Caldwell, Florence M.,	1305 Green street,	Philadelphia.
Caldwell, Joseph F.,	Ellwood City,	Lawrence county.
Caldwell, Robert A.,	Tarentum,	Allegheny county.
Calhoun, Albert R.,	4516 Lancaster avenue,	Philadelphia.
Calhoun, Bruce L.,	Verona,	Allegheny county.
Calhoun, James J.,	McKeesport,	Allegheny county.
Calhoun, John T.,	Kendall Creek,	McKean county.
Callaghan, Daniel O.,	2165 East York street,	Philadelphia.
Callaghan, E. M.,	9 Frankstown avenue,	Pittsburg.
Callender Wm. B.,	Bradford,	McKean county.
Calvert, John M.,	4301 Butler street,	Pittsburg.
Cameron, Chas. S.,	762 South Fifteenth street,	Philadelphia.
Camp, Benj. E.,	Elizabeth,	Beaver county.
Camp, Fred'k P.,	Port Allegheny,	McKean county.
Camp, Richard H.,	Port Allegheny,	McKean county.
Campbell, Andrew,	160 East Fourth street,	Williamsport.
Campbell, Curtin G.,	Johnstown,	Cambria county.
Campbell, Emerson,	2542 Richmond street,	Philadelphia.
Campbell, Harry M.,	146 McKean street,	Philadelphia.
Campbell, Hugh,	Osceola Mills,	Clearfield county.
Campbell, James T. B.,	New Castle,	Lawrence county.
Campbell, John C.,	Clarion,	Clarion county.
Campbell, J. L.,	Grove City,	Mercer county.
Campbell, L. B.,	Luzerne,	Luzerne county.
Campbell, Milton,	1800 Market street,	Philadelphia.
Campbell, Theodore,	Eleventh and South Sts.,	Philadelphia.
Campbell, Wm. H.,	DeKalb and Penn streets,	Norristown.
Canfield, Marshall B.,	Union City,	Erie county.
Canfield, Porter B.,	Corydon,	Warren county.
Cannon, Benj. J.,	Moscow,	Lackawanna county.
Canover, Samuel H.,	2228 N. 17th St.,	Philadelphia.
Canton, Herman C.,	433 West Eighth street,	Philadelphia.
Cantrell, James H.,	1000 South Second street,	Philadelphia.
Cantrell, Wm. A.,	1802 South Elghth street,	Philadelphia.
Cappell, Theodore,	3704 Forbes avenue,	Pittsburg.
Carberry, P. J. L.,	1618 Pine street,	Philadelphia.
Carey, Harry C.,	227 North Twelfth street,	Philadelphia.
Carey, Thos. H.,	Benton,	Columbia county.
Carl, Chas. B.,	Greencastle,	Franklin county.
Carmack, Geo. W.,	Phoenixville,	Chester county.
Carman, Geo. L.,	2201 Hunting Park avenue,	Philadelphia.
Carothers, Horace H.,	Charleroi,	Washington county.
Carothers, Samuel E.,	McKeesport,	Allegheny county.
Carpenter, H. C.,	Troy,	Bradford county.
Carpenter, Wm. A.,	829 N. 20th St.,	Philadelphia.
Carr, John D.,	Red Bank Furnace,	
Carroll, Sherman L.,	431 South Twentieth street,	Philadelphia.
Carson, Chas. R.,	1009 Vine street,	Philadelphia.
Carson, Jason W.,	Leechburg,	
Carsters, Louis P.,	1000 Spring Garden street,	Philadelphia.
Carter, Herbert G.,	3553 Turner street,	Philadelphia.

Carter, John P.,	131 East Market street,	Wilkes-Barre.
Cartwright, Chas. F.,	12th and Jefferson streets,	Philadelphia.
Case, John W.,	Hartstown,	Crawford county.
Cashman, Elmer W.,	York Springs,	Adams county.
Cassel, James W.,	1645 North Broad street,	Philadelphia.
Cassell, Wm. E.,	1645 North Sixth street,	Harrisburg.
Castle, Abraham L.,	Chester,	Delaware county.
Castner, Lewis C.,	6109 Penn avenue,	Pittsburg.
Castner, L. H.,	6109 Penn avenue,	Pittsburg.
Catherman, Isaac N.,	Selins Grove,	Snyder county.
Chaffee, Newton H.,	22d and South Sts.,	Philadelphia.
Chalfant, Wm. W.,	1440 S. 20th St.,	Philadelphia.
Chamberlain, John W.,	19th and Jefferson Sts.,	Philadelphia.
Chambers, Brinton H.,	Avondale,	Chester county.
Chambers, Geo. R.,	Emlenton,	Venango county.
Chambers, Oscar T.,	Honesdale,	Wayne county.
Chambers, Thos. S.,	Unionville,	Chester county.
Chambers, Wm. B.,	Tenth and Carson streets,	Pittsburg.
Chandler, Chas. F.,	1800 North Eleventh street,	Philadelphia.
Chandler, I. Eugene,	Kennett Square,	Chester county.
Chandler, Wm. A.,	1945 North Eleventh street,	Philadelphia.
Chandler, Wm. D.,	Strasburg,	Lancaster county.
Chapman, Alva L.,	Tarentum,	Allegheny county.
Chapman, B. Grant,	125 Haines street,	Germantown.
Chatham, John E.,	ThurLOW,	Delaware county.
Cherry, James B.,	501 Second avenue,	Pittsburg.
Cherry, Will M.,	Braddock,	Allegheny county.
Chesney, Hance C.,	Custer City,	McKean county.
Cheswright, James W.,	101 Wood street,	Pittsburg.
Childs, Walter F.,	1040 DeKalb street,	Norristown.
Childs, Wm. R.,	North Wales,	Montgomery county.
Chittenden, Chas. E.,	519 Lackawanna avenue,	Scranton.
Chrispens, John,	4600 Liberty avenue,	Pittsburg.
Christ, Chas. W.,	Milton,	Northumberland county.
Christman, Chas. D.,	Wisconsinco,	Dauphin county.
Christ, Geo. R.,	Brooklyn,	New York.
Christy, Robert,	315 Smithfield street,	Pittsburg.
Church, Thos. C.,	Jermyn,	Lackawanna county.
Church, Wm. F.,	Kingston,	Luzerne county.
Clabaugh, Edgar M.,	401 Sixth avenue,	Altoona.
Claphan, Hesser, C.,	Cum'b and Emerald Sts.,	Philadelphia.
Clark, Chas. H.,	36th and Race Sts.,	Philadelphia.
Clark, David C.,	2400 Columbia avenue,	Philadelphia.
Clark, Harry S.,	Uniontown,	Fayette county.
Clark, Hubert F.,	Carbondale,	Lackawanna county.
Clark, Joseph N.,	1111 North Third street,	Harrisburg.
Clark, J. Verner,	Washington,	Washington county.
Clark, Patrick,	Jamestown,	Mercer county.
Clark, Harry G.,	Brookville,	Jefferson county.
Clark, Richard,	Birdsboro,	Berks county.
Clark, Wm. G.,	20th and Diamond Sts.,	Philadelphia.
Clarke, Arthur,	Tarentum,	Allegheny county.
Clarke, E. Edwin,	Bradford,	McKean county.



Clarkson, Thos. R., ..... Shamokin, ..... Northumberland county.  
 Claudy, John C., ..... Newville, ..... Cumberland county.  
 Claudy, R. Blean, ..... Newville, ..... Cumberland county.  
 Clayton, Abraham T., .... Ogontz, .....  
 Clemens, James L., ..... Pottsville, ..... Schuylkill county.  
 Clemens, James J., ..... Pottsville, ..... Schuylkill county.  
 Clemens, John W., ..... Minersville, ..... Schuylkill county.  
 Clemens, Jonas G., ..... 7th and Germantown Ave., Philadelphia.  
 Clemson, Chas. E., ..... 54 North Fifth street, .... Reading.  
 Clemson, Francis C., .... Reading, ..... Berks county.  
 Cleveland, Fred. L., ..... 530 W. 19th St., ..... Erie  
 Clewell, Wm. H., ..... 2138 North Eleventh street, Philadelphia  
 Cliffe, Wm. L., ..... 2781 Kensington avenue. .. Philadelphia  
 Clinefelter, Plumer W., .. South Oil City, ..... Venango county  
 Cloud, Harlan, ..... Darby, ..... Delaware county  
 Cloud, Milton H., ..... Masontown, ..... Fayette county  
 Clutton, Frank, ..... Slippery Rock, ..... Butler county.  
 Clutton, Geo. W., ..... New Castle, ..... Lawrence county.  
 Clugston, John W., ..... Waynesboro, ..... Franklin county.  
 Coble, Aaron C., ..... Dauphin, ..... Dauphin county.  
 Cochran, Thos. A., ..... Apollo, ..... Armstrong county.  
 Codville, Harry L., ..... 6105 Woodland avenue, ... Philadelphia.  
 Codville, Wm. L., ..... 184 West Girard avenue, .. Philadelphia.  
 Coffey, Maurice G., ..... 630 East Water street, .... Lock Haven.  
 Coffin, Roscoe L., ..... 1005 Milton Place, ..... Baltimore, Md.  
 Coffrey, John B., ..... South Bethlehem, ..... Northampton county.  
 Coggins, Franklin, ..... 528 Arch street, ..... Philadelphia.  
 Cohen, Isaac, ..... 12th and Market Sts., .... Philadelphia.  
 Colbert Harry, ..... 32 South Seneca street, ... Oil City.  
 Colborn, I. Grant, ..... Mountain Top, ..... Luzerne county.  
 Colborn, Wm. T., ..... Ashley, ..... Luzerne county.  
 Cole, H. M., ..... 1438 Capouse avenue, .... Scranton.  
 Coleman, Addison A., .... Canonsburg, ..... Washington county.  
 Coleman, James H., ..... Canonsburg, ..... Washington county.  
 Coleman, Milton C., ..... Reynoldsville, ..... Jefferson county.  
 Coles, M. S., ..... Stony Fork, ..... Tioga county.  
 Coller, Wm. W., ..... 242 South Fourth street, .. Reading.  
 Collins, John H., ..... 2113 Park avenue, ..... Philadelphia.  
 Collom, Samuel S., ..... Saegertown, ..... Crawford county.  
 Coltman, Thos. C., ..... Jenkintown, .....  
 Colwes, Henry F., ..... 3704 Forbes street, ..... Pittsburg.  
 Comfort, Chas. L., ..... 17 North Eleventh street, Philadelphia.  
 Comfort, Newton C., .... 2601 Columbia avenue, ... Philadelphia.  
 Commings, Chas. S., ..... Schuylkill Haven, ..... Schuylkill county.  
 Comp, Harry G., ..... 30th and Diamond Sts., ... Philadelphia.  
 Compton, B. Frank, ..... Upland, ..... Delaware county.  
 Conard, Geo. M., ..... 2349 N. 17th St., ..... Philadelphia.  
 Conard, Thos. E., ..... 728 North Seventh street, . Philadelphia.  
 Conard, Norman S., ..... 13th and Jefferson Sts., ... Philadelphia.  
 Condict, Wm., ..... Brockwayville, ..... Jefferson county.  
 Conley, Edward M., ..... 233 Sandusky street, ..... Allegheny county.  
 Conley, Joseph X., ..... 509 Cato street, ..... Pittsburg.  
 Connely, S. S., ..... Pittsfield, ..... Warren county.

Conner, Geo. P.,	830 Chestnut street,	Philadelphia.
Conner, John B.,	Burnside,	Clearfield county.
Conner, Joseph, S.,	Beaver,	Beaver county.
Conner, Orlando,	Lincolntown,	Crawford county.
Conner, Wm.,	6733 Germantown avenue,	Germantown.
Connerton, Francis A.,	Hope Church,	
Conrad, Geo. E.,	514 Franklin street,	Johnstown.
Cohrad, Henry W.,	Osterburg,	Bedford county.
Conrey, Henry S.,	1013 Spruce street,	Philadelphia.
Conwell, Chas. L.,	237 Wyoming avenue,	Scranton.
Cook, Ellis, G.,	New Oxford,	Adams county.
Cook, Francis W.,	Spring City,	Chester county.
Cook, James G.,	New Alexander,	Westmoreland county.
Cook, John B.,	16th and Lombard Sts.,	Philadelphia.
Cook, Stephen G.,	Coatesville,	Chester county.
Cook, Wm. S. G.,	Coatesville,	Chester county.
Cooke, Geo.,	Oxford,	Chester county.
Cooke, Milton R.,	Jeannette,	
Cool, Romulus B.,	Ingram,	Allegheny county.
Cooley Harry C.,	27th and York Sts.,	Philadelphia.
Coon, Oliver P.,	Ceres,	McKean county.
Cooper, Herbert,	4032 Lancaster avenue,	Philadelphia.
Cope, Frank H.,	422 West Dauphin street,	Lancaster.
Cope, Geo. W.,	Nazareth,	Northampton county.
Cope, Thomas,	Nazareth,	Northampton county.
Copenhagen, John A.,	Tyrone,	Blair county
Copeland, James B.,	Myersdale,	Somerset county.
Corbett, Albert G.,	Clarion,	Clarion county.
Corbett, J. H.,	1322 Carson street,	Pittsburg.
Corbett, W. W.,	New Bethlehem,	Clarion county.
Corbyn, T. N.,	Franklin and Columbia avenue,	Philadelphia.
Corey, Wilbert E.,	Dravosburg,	Allegheny county.
Cornell, Edward A.,	Fourth and Pine streets,	Williamsport.
Cornell, Horace H.,	2112 N. 17th St.,	Philadelphia.
Cornell, Wharton L.,	16th and Tasker Sts.,	Philadelphia.
Cornfield, Abraham,	Mt. Carmel,	Northumberland county.
Cornman, John A.,	Mahoningtown,	Lawrence county.
Correll, Joseph B.,	628 Morton avenue,	Chester.
Correy, John M.,	Milton,	Northumberland county.
Corrie, Wm. M. G.,	1231 Snyder avenue,	Philadelphia.
Corson, Linwood S.,	27th and Oxford Sts.,	Philadelphia.
Corwin, J. H.,	Montrose,	Susquehanna county.
Costen, Wm. A.,	1634 Columbia avenue,	Philadelphia.
Cottam, Chas. M.,	1311 Fifth avenue,	Beaver Falls.
Cotterel, John W.,	1700 Ridge avenue,	Harrisburg.
Cottrell, Clarence V.,	Bradford,	McKean county.
Cotzhausen, Louis V.,	2349 Thompson street,	Philadelphia.
Coughenour, David R.,	Alverton,	Westmoreland county.
Conghenour Harry S.,	New Haven,	
Coulston, John B.,	Austin,	Potter county.
Coulter, N. S.,	Sligo,	Clarion county.
Coulter, P. L.,	McDonald,	Washington county.
Coulter, P. S.,	15th and Market Sts.,	Philadelphia.

Covell, Carlton H.,	Wilkinsburg,	
Covert, A. W.,	4401 Butler street,	Pittsburg.
Cowen, Wm. S.,	105 South Centre street,	Pottsville.
Cowles, Horace H.,	Lander,	Warren county.
Cowles, James P.,	Orwell,	Bradford county.
Cox, Andrew P.,	Big Run,	Jefferson county.
Cox, Geo. W.,	18th and Germantown ave.	Philadelphia.
Cox, Harry,	6001 Vine street,	Philadelphia.
Cox, Harry L.,	Ephrata,	Lancaster county.
Coxe, Hugh N.,	Schuylkill Haven,	Schuylkill county.
Coxe, Russel L.,	Schuylkill Haven,	Schuylkill county.
Cozens, Nathan A.,	1801 North Seventh street,	Philadelphia.
Crabtree, Samuel R.,	4832 Woodland avenue,	Philadelphia.
Craig, Ben. C.,	Brookville,	Jefferson county.
Craig, James,	3102 Richmond street,	Philadelphia.
Craig, James,	Fort Washington,	Montgomery county.
Craig, James S.,	St. Petersburg,	Clarion county.
Craig, John F.,	Clintonville,	Venango county.
Craig, Samuel A.,	West Alexander,	Washington county.
Craig, Samuel B.,	Noblestown,	
Craig, Wm. H.,	Freedom,	Beaver county.
Craighead, Geo. S.,	3018 Susquehanna avenue,	Philadelphia.
Craighead, Thos.,	2602 Richmond street,	Philadelphia.
Craine, W. M. C.,	400 Chestnut avenue,	Altoona.
Crass, John H.,	3020 Euclid avenue,	Philadelphia.
Crawford, Joseph,	Frankford Ave. and Hart Lane,	Philadelphia.
Crawford, Luther L.,	Uniontown,	Fayette county.
Crawford, M. P.,	Mifflintown,	Juniata county.
Crawford, Samuel D.,	Lock Haven,	Clinton county.
Crawford, Walter,	Nazareth,	Northampton county.
Crawford, Wilbur F.,	Newberry,	Lycoming county.
Crawford, William H.,	Nazareth,	Northampton county.
Creasy, L. S.,	Rock Glen,	Luzerne county.
Creighton, Benj. T.,	Haddonfield,	New Jersey.
Creighton, Orville S.,	410 Race street,	Philadelphia.
Creswell, Robert,	Hawthorne,	Clarion county.
Cribbs, John D.,	Cypress street,	Pittsburg.
Cribbs, Wm. M.,	Cypress street,	Pittsburg.
Crissman, O. E.,	Kipple,	Blair county.
Crissman, S. S.,	Phillpsburg,	Centre county.
Crooks, Elmo M.,	525 S. 13th St.,	Philadelphia.
Crooks, Wm. C.,	525 S. 13th St.,	Philadelphia.
Crothers, James L.,	2001 Fairmount avenue,	Philadelphia.
Crotzer, Frank P.,	159 East Market street,	Wilkes-Barre.
Crotzer, Robert K.,	Adams and Lindsey Sts.,	Scranton.
Crouch, Wallace H.,	Ellwood City,	Lawrence county.
Crowell, Chas. M.,	West Chester,	Chester county.
Crowthers, Thos. A.,	Coal Centre,	Washington county.
Crumble, Geo. J.,	Broad and Alleg avenue,	Philadelphia.
Cubbison, Wm. W.,	New Castle,	Lawrence county.
Culbert, Joseph W.,	Collegeville,	Montgomery county.
Culin, Mrs. Melisia,	4128 Market street,	Philadelphia.

Culley, John, .....	1126 Vine street, .....	Philadelphia.
Cummings, T. F., .....	Tarentum, .....	Allegheny county.
Cunningham, A. A., .....	Volant, .....	Lawrence county.
Cunningham, Wm. J., .....	1410 Seventh avenue, .....	Beaver Falls.
Curry, John L., .....	240 Callowhill street, .....	Philadelphia.
Curry, Wm. H., .....	Gastonville, .....	Washington county.
Curtin, Daniel J., .....	Philadelphia.	
Curtis, Frank A., .....	Cochrannton, .....	Crawford county.
Curtis, L. C., .....	Utica, .....	Venango county.
Cushen, Harry R., .....	1000 Spring Garden street, .....	Philadelphia.
Cuthbert, Richard W., .....	4000 Chestnut street, .....	Philadelphia.
Dack, James, .....	Pleasantville, .....	Venango county.
Dahis, Geo. E., .....	49th and Woodland Ave., .....	Philadelphia.
Dale, James A., .....	19 South George street, .....	York.
Dale, W. H., .....	Houtzdale, .....	
Dalpe, Fred'k A., .....	831 Corinthian avenue, .....	Philadelphia.
Dalton, D. Alfred, .....	Upland, .....	Delaware county.
Dalton, Joseph E., .....	Glenolden, .....	
Damburn Gustave, .....	Shiloh and Virginia Ave., .....	Philadelphia.
Dancy, Henry H., .....	5834 Knok street, .....	Germantown.
Dare, Chas. W., .....	Troy, .....	Bradford county.
Dare, Geo. S., .....	2d and Wyoming Ave., .....	Philadelphia.
Darling, Lewis H., .....	Chandlers Valley, .....	
Darlington, Horace H., .....	Concordville, .....	Delaware county.
Daugherty, John M., .....	Indiana, .....	Indiana county.
Davenport, Elbridge F., .....	Albion, .....	Erie county.
Davis, Alfred, .....	Taylorville, .....	Lackawanna county.
Davis, B. Frank, .....	19th and Fairmount Ave., .....	Philadelphia.
Davis, Chas. W., .....	77 Ohio street, .....	Allegheny.
Davis, David Jr., .....	634 Preble avenue, .....	Allegheny.
Davis, David R., .....	Lansford, .....	Carbon county.
Davis, Dexter C., .....	Oakdale, .....	Allegheny county.
Davis, Edward M., .....	Lee Park, .....	Wilkes-Barre.
Davis, Frank C., .....	16th and Vine streets, .....	Philadelphia.
Davis, Fred'k H., .....	2902 Richmond street, .....	Philadelphia.
Davis, Geo. H., .....	1060 Germantown avenue, .....	Philadelphia.
Davis, Geo. W., .....	Centralia, .....	Columbia county.
Davis, Geo. W., .....	122 Mulberry street, .....	Scranton.
Davis, Harry I., .....	Hollidaysburg, .....	Blair county.
Davis, Harvey A., .....	Ebensburg, .....	Mercer county.
Davis, Ira W., .....	Sheakleysville, .....	Cambria county.
Davis, Isaac, .....	1060 Germantown avenue, .....	Philadelphia.
Davis, Jonathan W., .....	Plymouth, .....	Luzerne county.
Davis, Joseph, .....	Taylor, .....	Lackawanna county.
Davis, Kate I., .....	Frackville, .....	Schuylkill county.
Davis, Mary M., .....	Ardmore, .....	Montgomery county.
Davis, Robert L., .....	237 North Tenth street, .....	Philadelphia.
Davis, Summer D., .....	Jermyn, .....	Lackawanna county.
Davis, Thos. B., .....	Williamstown, .....	Dauphin county.
Davis, Thos. E., .....	Summit Hill, .....	Carbon county.
Davis, Wm., .....	Mt. Carmel, .....	Northumberland county.
Davis, Wm. A., .....	Frackville, .....	Schuylkill county.
Davis, Wm. H., .....	Prince and James streets, .....	Lancaster county.

Davis, Wm. W.,	77 Ohio street,	Allegheny.
Davison, Blythe J.,	.. Canton,	Bradford county.
Davison, Geo. S.,	.. 900 Callowhill street,	Philadelphia.
Davison, James E.,	.. 7042 Frankstown avenue,	Pittsburg.
Davy Geo. W	.. Coatesville,	Chester county.
Dawson, Frank,	.. 2301 North Third street,	Philadelphia.
Day, Dudley B.,	.. Ridgway,	Elk county
Day, Samuel A.,	.. 12th and Mt. Vernon Sts.,	Philadelphia.
Dean, John M.,	.. Parkesburg,	Chester county.
Dean, Norman R.,	.. 6102 Main street,	Germantown.
Dearth, Olie P.,	.. Brownsville,	Fayette county.
DeBenst, Robert H.,	.. 1801 South street,	Philadelphia.
Deckard, John W.,	.. Richfield,	Juniata county.
Decker, Henry T.,	.. Penn and Frankstown Aves.,	Pittsburg.
Deemer, Geo. M. H.,	.. Greensburg,	
Deen, Frank S.,	.. 5 Locust street,	Lancaster.
Deëns, John L.,	.. Johnstown,	Cambria county.
Deford, Wm. H.,	.. Frankport Springs,	Beaver county.
DeFrance, H. T.,	.. Johnstown,	Cambria county.
DeFrehn, Chas. W.,	.. 403 West Arch street,	Pottsville.
DeGraffe, Bertha L.,	.. 1330 Arch street,	Philadelphia.
Delbert, Thos. I.,	.. Pottsville,	Schuylkill county.
Deininger, John W.,	.. Chestnut Hill,	Philadelphia.
Deiss, Wm.,	.. 401 Walnut street,	Harrisburg.
DeKalb, H. L.,	.. 429 Arch street,	Philadelphia.
Delker, Wm.,	.. 1020 South Second street,	Philadelphia.
Demaree, Wm. L.,	.. Bloomsburg,	
Dengler, Geo. L.,	.. 242 Ninth street,	Reading.
Denison, Mary E.,	.. 404 W. King street,	Lancaster.
Dennis, Frank E.,	.. Carbondale,	Lackawanna county.
Dennison, Burt E.,	.. Bruhn,	Butler county.
Dennison, Geo. E.,	.. Downingtown,	Chester county.
Denniston, Wm. M.,	.. Hollidaysburg,	Blair county
Denny John F.,	.. Ellwood City,	Lawrence county.
DeNormandie, H. W.,	.. Washington,	Washington county.
DeReeves, A. E.,	.. 1436 Market street,	Philadelphia.
Deshong, James B.,	.. 202 Herr street,	Harrisburg.
DeToland, Arthur,	.. 110 North Eleventh street,	Philadelphia.
Detwiler, Wm. P.,	.. Phoenixville,	Chester county.
Devine, Geo. C.,	.. 1501 S. 19th St.,	Philadelphia.
Devlin, Wm.,	.. New Castle,	Lawrence county.
Dewees, Wm. H.,	.. 1600 Arch street,	Philadelphia.
Dewey, Herbert W.,	.. Sharpsburg,	Allegheny county.
DeWitt, A. M.,	.. Orangeville,	Columbia county.
DeWolf, W. L.,	.. Millerstown,	Butler county.
Dick, James W.,	.. New Oxford,	Adams county.
Dickel, Wm. J.,	.. 1302 Hanover street,	Philadelphia.
Dickerson, William E.,	.. Media,	Delaware county.
Dickerson, Chas. S.,	.. 711 State street,	Erle.
Dickinson, Robert C.,	.. 1120 State street,	Erle.
Dickson, Joseph H.,	.. 819 Penn avenue,	Pittsburg.
Dickson, W. S.,	.. McConnellsburg,	Fulton county.

Diefenbach, Wm.,	..... Erie,	..... Erie county.
Dieroil, Chas. B.,	..... 722 N. 11th St.,	..... Philadelphia.
Dietrich, Henry D.,	..... 203 South Fourth street,	..... Reading.
Dietrich, Pierce A.,	..... 1010 Green street,	..... Philadelphia.
Dilks, M. Louise,	..... 541 Pine street,	..... Philadelphia.
Dill, Benjamin,	..... 756 N. 24th St.,	..... Philadelphia.
Dill, John N.,	..... Prosperity,	..... Washington county.
Dinges, Jeremiah N.,	..... Eoasburg,	..... Centre county.
Dippery, Geo. C.,	..... Reedsville,	..... Mifflin county.
Dirmitt, Chas. H.,	..... 1201 S. 19th St.,	..... Philadelphia.
Disbrow, Burt F.,	..... Erie,	..... Erie county.
Disque, Henry,	..... 196 Arch street,	..... Allegheny.
Dittler, Fred k A.,	..... 12th and Carson Sts.,	..... Pittsburg.
Diveley, M. S.,	..... McKees Rocks,	..... Allegheny county.
Dix, Levin A.,	..... 799 South Second street,	..... Philadelphia.
Dixon, Edgar K.,	..... Scottsdale,	..... Westmoreland county.
Dodds, Joseph M.,	..... Willmerding,	.....
Dodge, Buel,	..... Honesdale,	..... Wayne county.
Dodson, Chas. G.,	..... 127 South Fourth street,	..... Philadelphia.
Dodson, Robert C.,	..... Emporium,	..... Cameron county.
Doench, Theodore,	..... 1607 Ridge avenue,	..... Philadelphia.
Doerflinger, Theodore,	..... 1322 Carson street,	..... Pittsburg.
Doll, John,	..... 1512 Peach street,	..... Erie.
Donoghue, James,	..... Girardsville,	..... Schuylkill county.
Donaghue, Robert L.,	..... 1307 Christian street,	..... Philadelphia.
Donahue, John P.,	..... 1428 Stone avenue,	..... Scranton.
Donaldson, H. A.,	..... Irwin,	..... Westmoreland county.
Donaldson, Joseph B.,	..... Canonsburg,	..... Washington county.
Donecker, Edwin A.,	..... 226 North Ninth street,	..... Allentown.
Dongal, Chas. H.,	..... Milton,	..... Northumberland county.
Donnelly, Wm.,	..... Galeton,	.....
Donough, Chas. S.,	..... Lebanon,	..... Lebanon county.
Donough, Wm. E.,	..... Edge Hill,	..... Montgomery county.
Doonan, Francis P.,	..... Dunbar,	..... Fayette county.
Dirrity, Alexander,	..... 533 Grant street,	..... Pittsburg.
Dorman, Wm. A.,	..... Phoenixville,	..... Chester county.
Dornsife, Daniel H.,	..... Tunkhannock,	..... Wyoming county.
Dorow, Albert O.,	..... 410 Market street,	..... Pittsburg.
Dosch, Benton G.,	..... 34 Ohio street,	..... Allegheny.
Doty, Cleon L.,	..... Warren,	..... Warren county.
Dougherty, James R., Jr.,	..... Indiana,	..... Indiana county.
Dougherty, Joseph M.,	..... Fayetteville,	..... Franklin county.
Dougherty, S. Clark,	..... Jeannette,	.....
Douglass, Serrill,	..... Fristol,	..... Bucks county.
Douglass Wm. T.,	..... 1137 Derry street,	..... Harrisburg.
Douthett, Geo. S.,	..... 6030 Penn avenue,	..... Pittsburg.
Downe, Wm. D.,	..... 157 West Market street,	..... Scranton.
Downey, Thos.,	..... Corry,	..... Erie county.
Drake, Theodore,	..... 435 Arch street,	..... Philadelphia.
Driesbach, Luther A.,	..... 1155 S. 20th St.,	..... Philadelphia.
Driggs, Chas. M.,	..... White Haven,	..... Luzerne county.
Drorbaugh, James E.,	..... Williamsport,	..... Lycoming county.
Druitt, Anna B.,	..... Mt. Oliver,	..... Allegheny county.

Drewitt, Samuel H., ..... Mt. Oliver, ..... Allegheny county.  
 Drum, Chas. M., ..... 111 Parrish street, ..... Wilkes-Barre.  
 Drumheller, F. E., ..... 406 Market St., ..... Sunbury.  
 Dubbs, Robert L., ..... Atlantic City, ..... New Jersey.  
 Duble, Jesse B., ..... 317 Park avenue, ..... Williamsport.  
 Duble, Jesse C., ..... Fourth and Pine streets, Williamsport.  
 DuBois, Samuel C., Jr., .. 1201 Columbia avenue, ... Philadelphia.  
 Dudley, Emory G., ..... Washington, ..... Washington county.  
 Duff, Henry G., ..... 315 Smithfield street, .... Pittsburg.  
 Duff, James E., ..... New Castle, ..... Lawrence county.  
 Dueld, Harrison, ..... 6th and Huntingdon Sts., Philadelphia.  
 Dunaway A. B., ..... Greensboro, ..... Greene county.  
 Dunbar, Milton J., ..... Reading, ..... Berks county.  
 Duncan, Hosea M., ..... Mt. Pleasant, ..... Westmoreland county.  
 Dunlap, Samuel R., ..... New Galllee, ..... Beaver county.  
 Dunn, John B., ..... Watsonstown, ..... Northumberland county.  
 Dunn, Leon S., ..... Fairchance, ..... Fayette county.  
 Durbin, John Geo., ..... Plymouth, ..... Luzerne county.  
 Durham, Albert R., ..... 16 S. 15th St., ..... Reading.  
 Durham, John C., ..... Kane, ..... McKean county.  
 Durham, John M., ..... 16 S. 15th St., ..... Reading.  
 Durham, Wm. M., ..... Corry, ..... Erie county.  
 Dutt, Frederick A., ..... 1011 Arch street, ..... Philadelphia  
 Dutton, Albert E., ..... Norristown, ..... Montgomery county.  
 Eagon, Elmer E., ..... East Liverpool, ..... Ohio.  
 Eakin, Henry G., ..... 301 North Sixth street, ... Philadelphia.  
 Earl, Wm., ..... Ridgway, ..... Elk county.  
 Easterwood, Frank K., ... Meadville, ..... Crawford county.  
 Eaton, Albert M., ..... 2018 North Eleventh street, Philadelphia.  
 Ebaugh, Wm. C., ..... 38th and Lancaster Ave.,... Philadelphia.  
 Eble, Charles, ..... 6009 Penn avenue, ..... Pittsburg.  
 Eberhart, Wm. F., ..... 719 Ligonier street, ..... Latrobe.  
 Eberly, David A., ..... Mechanicsburg, ..... Cumberland county.  
 Eberly, Frank H., ..... 2500 Oxford street, ..... Philadelphia.  
 Eberly, J. Addison, ..... 2500 Oxford street ..... Philadelphia.  
 Eberman, Frank L., ..... Centreville, ..... Crawford county.  
 Eberman, John S., ..... California, ..... Washington county.  
 Ebert, Chas. M., ..... Mauch Chunk, ..... Carbon county.  
 Ebert, Sarah E., ..... Mauch Chunk, ..... Carbon county.  
 Eby, Edwin S., ..... Newport, ..... Perry county.  
 Echels, C. A., ..... 600 South Broad street, ... Philadelphia.  
 Eckels, G. Morris, ..... Mechanicburg, ..... Cumberland county.  
 Eckels, Thos. M., ..... Wampum, ..... Lawrence county.  
 Eckels, Walter L., ..... Mechanicsburg, ..... Cumberland county.  
 Eckert, Abia Z., ..... Lancaster, ..... Lancaster county.  
 Eckert, John W., ..... Easton, ..... Northampton county.  
 Eck's, Whit A., ..... Beaver Falls, ..... Beaver county.  
 Eddy, Geo. V., ..... 4128 Market street, ..... Philadelphia.  
 Eddy, Henry C., ..... 423 S. 18 St., ..... Philadelphia.  
 Edgar, I. Warren, ..... Stillwater, ..... Columbia county.  
 Edle, John B., ..... 1105 Walnut street, ..... McKeesport.  
 Edmonson, Wm. M., ..... Renovo, ..... Clinton county.  
 Edwards, Chas. M., ..... 1109 Semerville street, .... Philadelphia.

Edwards, John W.,	339 Fifth avenue,	Pittsburg.
Eft, Frederick,	241 North Twelfth street,	Philadelphia.
Eggers, Edward E.,	172 Ohio street,	Allegheny.
Eggers, Fred'k H.,	172 Ohio street,	Allegheny.
Eggers, Fred'k W.,	172 Ohio street,	Allegheny.
Eggert, Geo. L. G.,	Parkers Landing,	Armstrong county.
Ehman, Joseph W.,	706 Tasker street,	Williamsport.
Eichelberger, Eli,	Saxton,	Bedford county.
Eichelberger, John C.,	Saxton,	Bedford county.
Eichnor, George,	Myersdale,	Somerset county.
Eicke, N. Marion,	347 Adams avenue,	Scranton.
Eller, Edward,	Meadville,	Crawford county.
Eller, Valentine W.,	Meadville,	Crawford county.
Einstein, Morris,	170 East street,	Allegheny.
Eisenbels, Wm. F.,	Allegheny,	
Eisenhart, Edward K.,	Bangor,	Northampton county.
Eisenhart, Foster B.,	829 N. 26th St.,	Philadelphia.
Eisenhart, Harry P.,	Hanover,	York county.
Eisenhuth, Jacob,	Millhelm,	Centre county.
Elden Wm. McK.,	Roaring Springs,	Blair county.
Eldridge, Samuel B.,	Brooklyn,	Susquehanna county.
Elfreth, Caleb P.,	148 South street,	Philadelphia.
Elfreth, Caleb P., Jr.,	148 South street,	Philadelphia.
Elfreth, Jacob R.,	1201 Columbia avenue,	Philadelphia.
Ellinger, F. J.,	737 N. 41st St.,	Philadelphia.
Elliott, Arthur H.,	Wellsboro,	Tioga county.
Elliott, Henry W.,	Lawrenceville,	Tioga county.
Elliott, Walter R.,	Newtown,	
Elliott, Wm. D.,	429 Arch street,	Philadelphia.
Ellis, Geo. W.,	Minersville,	Schuylkill county.
Ellis, Wardle,	Media,	Delaware county.
Elm, Paris F.,	Shippensburg,	Cumberland county.
Elrich, John M.,	Harrisville,	Butler county.
Elwell, Albert S.,	1502 Richmond street,	Philadelphia.
Ely, Benj. C.,	Girard,	Erie county.
Ely, B. M.,	Newport,	Perry county.
Ely, Chas. S.,	Millville,	
Ely, Frank W.,	710 Park avenue,	Williamsport.
Ely, Harry B.,	Ariel,	Wayne county.
Ely, Richard H.,	Laceyville,	Lycoming county.
Ely, Samuel S.,	1424 Norris street,	Philadelphia.
Emanuel, Louis,	2nd Ave. and Grant St.,	Pittsburg.
Emerson, Henry E.,	Millford,	Pike county.
Emlet, Jacob L.,	Hanover,	York county.
Emerick, E. M.,	40 South Market street,	Shamokin.
Empfield, Frank T.,	Indiana,	Indiana county.
Endicott, John F.,	11th and McKean Sts.,	Philadelphia.
England, Joseph W.,	34th and Pine Sts.,	Philadelphia.
England, Wm. T.,	800 South Tenth street,	Philadelphia.
Engle, Stratton P.,	Burlington,	New Jersey.
English, Geo. H.,	Chelton and Pulaski aves.,	Germantown.
Ensign, Henry C.,	Waymart,	Wayne county.
Ensminger, Samuel A.,	Manheim,	Lancaster county.



Ercanbrack, Geo. T.,	Athens,	Bradford county.
Erdman, Milton S.,	Richlandtown,	Bucks county.
Erven, Chas. M.,	Plumville,	Indiana county.
Esenwein, Augustus,	Sixth and Franklin Sts.,	Reading.
Esenwein, John R.,	6519 Germantown avenue,	Philadelphia.
Esler, James M.,	Tarentum,	Allegheny county.
Essick, Howard M.,	Picture Rocks,	Lycoming county.
Estabrook, Wm. T.,	Great Bend,	Susquehanna county.
Estlack, Horace W.,	1233 S. 17th St.,	Philadelphia.
Evans, Albert O.,	Connellsville,	Fayette county.
Evans, Alex R.,	Rosemont,	
Evans, Aneurin,	Kingston,	Luzerne county.
Evans, Edward,	Scranton,	Lackawanna county.
Evans, Geo. B.,	1106 Chestnut street,	Philadelphia.
Evans, Geo. B.,	Manayunk,	Philadelphia.
Evans, John H.,	Media,	Delaware county.
Evans, J. Howard,	Sixth and Venango streets,	Philadelphia.
Evans, Joseph S.,	West Chester,	Chester county.
Evans, Lewis B.,	1736 North Tenth street,	Philadelphia.
Evans, Myron J.,	130 South Main street,	Scranton.
Everett, Chas. A.,	Lemont,	Centre county.
Eves, Ellis,	Millville,	Columbia county.
Eves, Wm. W.,	Millville,	Columbia county.
Ewing, Geo. W.,	710 South Second street,	Philadelphia.
Ewing, Jackson S.,	Portage,	Cambria county.
Eyler, Edward A.,	250 Jefferson street,	Philadelphia.
Eyer, Harvey B.,	Hopewell,	Bradford county.
Eyler, Maurice E.,	107 South Main street,	Chambersburg.
Fackenthall, John M.,	122 S. 21st St.,	Philadelphia.
Fackler, Lewis H.,	E. Berlin,	Adams county.
Faessel, John A.,	202 Fulton street,	Allegheny.
Fager, Christian M.,	1223 North Sixth street,	Harrisburg.
Fahey, Edward H.,	13th and Race Sts.,	Philadelphia.
Fajans, Julian,	3707 Ridge avenue,	Wissahickon.
Falck, Milton S.,	Tyrone,	Blair county.
Falloure, Edwin R.,	1300 Frankford avenue,	Philadelphia.
Faner, John H.,	237 Wyoming avenue,	West Pittston.
Farley, Harvey N.,	Equinunk,	Wayne county.
Farley, Wm. H.,	222 East Broad street,	Chester.
Farnsworth, Anthony,	1123 Green street,	Philadelphia.
Farrell, Francis A.,	Kingston,	Luzerne county.
Farrell, Frank E.,	Johnstown,	Cambria county.
Farver, Rufus C.,	New Lebanon,	Mercer county.
Faulds, W. H.,	Luzerne,	Luzerne county.
Faulkner, Chas. P.,	Venango,	Crawford county.
Faunce, Benj. Rice,	1114 Marlborough street,	Philadelphia.
Faunce, Wm. H.,	501 East Girard avenue,	Philadelphia.
Faust, John K.,	306 Miller street,	Reading.
Faust, Peter,	428 Hickory street,	Scranton.
Fawcett, John W.,	701 Fifth avenue,	McKeesport.
Fairheller, Theo. D.,	2110 North Sixth street,	Philadelphia.
Feather, Francis F.,	Sandy Lake,	Mercer county.
Feather, H. C. L.,	Sandy Lake,	Mercer county.

Feather, John C.,	Sandy Lake,	Merer county.
Fegley, Orlando,	544 North Front street,	Allentown.
Fegley, Oscar G.,	1334 S. 22nd St.,	Philadelphia.
Fegley, Wm. L.,	544 North Front street,	Allentown.
Fehr, Geo. W.,	Tenth and Vine streets,	Philadelphia.
Feicht, Chas. M.,	Reynoldsville,	Jefferson county.
Feidt, Geo. D.,	604 Arch street,	Philadelphia.
Felker, Harry,	South Bethlehem,	Northampton county.
Ferguson, David S.,	2200 Frankford avenue,	Philadelphia.
Ferguson, Enoch P.,	Coatesville,	Chester county.
Ferguson, Frank U.,	Gallitzin,	Cambria county.
Ferguson, Hugh,	Beaver Falls,	Beaver county.
Ferguson, James O.,	124 W. Thompson St.,	Philadelphia.
Fernsler, Edwin K.,	Terre Hill,	Lancaster county.
Fernsler, Edward S.,	109 East Arch street,	Pottsville.
Fernsler, Harry O.,	32 Webster avenue,	Pittsburg.
Fessler, T. A.,	Huntingdon,	Huntingdon county.
Fetterhoff, Daniel W.,	36th and Woodland Ave.,	Philadelphia.
Fetters, Frank P.,	801 North Third street,	Philadelphia.
Fetters, Wm. A.,	801 North Third street,	Philadelphia.
Fiedler, Albert R. H.,	Ridge Ave., and James St.,	Philadelphia.
Fieid Wm. S. N.,	8th and Lombard streets,	Philadelphia.
Filding, John F.,	Chester,	Delaware county.
Fienhold, Edward H.,	13th and Morris Sts.,	Philadelphia.
Fies, John H.,	51 South Lime street,	Lancaster county.
Fike, Giles A.,	Dundaff,	Lusquehanna county.
Fillman, Eugene,	DeKalb and Jacoby Sts.,	Norristown.
Finck, Edward V.,	208 Girard avenue,,	Philadelphia.
Findley, J. A.,	Indiana,	Indiana county.
Fink, Allen J.,	Hamburg,	Berks county.
Fink, Geo. W. M.,	Irwin,	Westmoreland county.
Finkbliner, Martin L.,	10 North Hanover street,	Pottstown.
Finkelpearl, Joseph,	801 Fifth avenue,	Pittsburg.
Finley, A. C.	6638 Deary avenue,	Pittsburg.
Finley, Norval H.,	6638 Deary street,	Pittsburg.
Finnerty, Edward J., Jr.,	18th and McKean Sts.,	Philadelphia.
Finney, Wm. E.,	Chambersburg,	Franklin county.
Fischer, Fred'k F.,	2332 Frankford avenue,	Philadelphia.
Fischer, Wm.,	Erie,	Erie county.
Fishel, Henry W.,	Dillsburg,	York county.
Fisher Edmund K.,	Broad and Germ't Ave.,	Philadelphia.
Fisher, Edwin,	513 North Ninth street,	Reading.
Fisher, Franklin,	Macungie,	Lehigh county.
Fisher, Joshua F.,	Catawissa,	Luzerne county.
Fisher, K. Ludwick,	Glen Lyon,	Columbia county.
Fisher, Margaret E.,	Springboro,	Dawford county.
Fister, Thos. W.,	Sunbury,	Northumberland county.
Fitch, A. B.,	Factoryville,	Wyoming county.
Fitch, Geo. B.,	3719 Powelton avenue,	Philadelphia.
Fitch, Petallah,	1739 Vine street,	Philadelphia.
Fithian, Isaac N.,	Grove City,	Mercer county.
Fitzgerald, Maurice,	Conneautville,	Dawford county.

Fitzpatrick, Philip T.,	28 Shippen street,	Lancaster.
Flanagan, Thos. F.,	Mahanoy City,	Schuylkill county.
Flecher, Bernard,	Fryburg,	Clarion county.
Fleming, Daniel W.,	8th and Noble Sts.,	Philadelphia.
Fleming, Frank B.,	Shippensburg,	Cumberland county.
Fleming Geo. S.,	416 Market street,	Pittsburg.
Fleming John A.,	Shippensburg,	Cumberland county.
Fleming, Joseph E.,	Pittston,	Luzerne county.
Fleming, Walter,	Ridge Ave and Brown St.,	Philadelphia.
Fletcher, Benj. K.,	1626 Christian street,	Philadelphia.
Fletcher, E. B.,	362 W. 18th St.,	Erie.
Flexer Lewis A.,	Tamanend,	Schuylkill county.
Flitcraft Warren W.,	Woodstown,	New Jersey.
Floyd, Chas. S.,	Austin,	Potter county.
Fluck, Chas. L.,	18th and Jefferson Sts.,	Philadelphia.
Fluck, Franklin W.,	24th & Montgomery Ave.,	Philadelphia.
Follmer, Daniel,	5th and Callowhill Sts.,	Philadelphia.
Follmer, J. S.,	Milton,	Northumberland county.
Foltz, John B.,	1839 North Sixth street,	Harrisburg.
Fones, James H. D.,	Tionesta,	Forest county.
Foote, James A.,	Canonsburg,	Washington county.
Foote, John A.,	Archbald,	Lackawanna county.
Foote, Mrs. M. A.,	Archbald,	Lackawanna county.
Fording, Thos. E.,	Kerr avenue,	Pittsburg.
Foresman, Harry B.,	322 N. 13th St.,	Philadelphia.
Forgy, Joseph J.,	731 N. 40th St.,	Philadelphia.
Forney, Chas. M. C.,	426 Market street,	Harrisburg.
Forrest, Albert D.,	Germ't Ave & Junlata St.,	Philadelphia.
Forrest, Wm. J.,	80 Washington avenue,	Pittsburg.
Foest, Wm. H.,	1601 Carson street,	Pittsburg.
Forrsythe, Geo. W.,	Natrona,	Allegheny county.
Forthman, Ferdinand,	Waynesboro,	Franklin county.
Foster, Frank R.,	Smethport,	McKean county.
Foster, Geo. A.,	Wilkesburg,	Allegheny county.
Foster, Whildin,	Second and Green streets,	Philadelphia.
Foster, Wm. C.,	Petrolia,	Butler county.
Fowler, Hudson D.,	19th and Dauphin Sts.,	Philadelphia.
Fowler, M. N.,	Foxburg,	Clarion county.
Fox, Chas. F.,	266 Arlington avenue,	Pittsburg.
Fox, Francis,	Front and Broad streets,	Philadelphia.
Fox, Peter P.,	73rd and Woodland Ave.,	Philadelphia.
Fralley, Wm. O.,	250 East King street,	Lancaster.
Frame, Wallace V.,	874 Holly street,	Philadelphia.
Franciscus, Wm. C.,	Lock Haven,	Clinton county.
Frank, John A.,	Turtle Creek,	Allegheny.
Frank, Louis,	South and Lincoln Sts.,	Wilkes-Barre.
Frank, Luther B.,	Rebersburg,	Centre county.
Frank, Theo. J.,	277 Federal street,	Allegheny.
Frank, Theron N.,	2501 North Broad street,	Philadelphia.
Frankelberger, A. J.,	13th and Dauphin Sts.,	Philadelphia.
Franks, Michael S.,	Coal Centre,	Fayette county.
Frantz, D. J.,	Fairchance,	Washington county.
Frantz, Geo. B.,	Coal Centre,	Washington county.

Frantz, Wm. W.,	.....	New Castle,	.....	Lawrence county.
Frauck, Chas. C.,	.....	305 Cherry street,	.....	Philadelphia.
Fraunfelder, R. D.,	.....	2262 North Seventh street,	.....	Philadelphia.
Freas, Sylvester K.,	.....	2008 N. 17th St.,	.....	Philadelphia.
Freas, Wm. K.,	.....	1921 Uber street,	.....	Philadelphia.
Fredericks, Henry,	.....	722 N. 43rd St.,	.....	Philadelphia.
Freebing, Otto F.,	.....	231 Franklin avenue,	.....	Pittsburg.
Freeman, Clayton L.,	.....	223 North Ninth street,	.....	Allentown.
Freeman, Geo. W.,	.....	3321 North Broad street,	.....	Philadelphia.
Freeman, John W.,	.....	Derry,	.....	Westmoreland county.
Freethy, Chas. H.,	.....	217 South Ninth street,	.....	Philadelphia.
French, Adelbert P.,	.....	Susquehanna,	.....	Susquehanna county.
French, Francis F.,	.....	Merionville,	.....	Montgomery county.
French, Edward E.,	.....	Bentleyville,	.....	Washington county.
Freshell, Geo.,	.....	3526 Haverford avenue,	.....	Philadelphia.
Freseman, Wm. L.,	.....	167 Washington avenue,	.....	Allegheny.
Fretz, Abraham N.,	.....	Fleetwood,	.....	Berks county.
Fretz, C. D.,	.....	Sellersville,	.....	Bucks county.
Fretz, Mahlon B.,	.....	2967 Frankford avenue,	.....	Philadelphia.
Fretz, Oliver H.,	.....	Quakertown,	.....	Bucks county.
Frey, Andrew G.,	.....	116 North Queen street,	.....	Lancaster.
Frey, John P.,	.....	16th and Tasker Sts.,	.....	Philadelphia.
Frey, John W.,	.....	18th and Berks streets,	.....	Philadelphia.
Frew, Geo. B.,	.....	Paradise,	.....	Lancaster county.
Fries, Chas. J. V.,	.....	1933 Bainbridge street,	.....	Philadelphia.
Fritzinger, Richard J.,	.....	131 North Tenth street,	.....	Philadelphia.
Fronefield, J. M., Jr.,	.....	Wayne,	.....	Delaware county.
Frontz, Edward E.,	.....	753 East Third street,	.....	Williamsport.
Frontz, Chas. G.,	.....	239 North Twelfth street,	.....	Philadelphia.
Fruh, Carl D. S.,	.....	1645 North Broad street,	.....	Philadelphia.
Fruh, Ernest,	.....	1645 North Broad street,	.....	Philadelphia.
Fruh, Gustav A.,	.....	1645 North Broad street,	.....	Philadelphia.
Fruh, Mary E. S.,	.....	1649 North Broad street,	.....	Philadelphia.
Fry, Clinton M.,	.....	672 North Tenth street,	.....	Philadelphia.
Fry, Franklin L.,	.....	Manor Station,	.....	Westmoreland county.
Fry, Harry E.,	.....	341 Pine street,	.....	Williamsport.
Fry, Hiram P.,	.....	Lititz,	.....	Lancaster county.
Fry, Nelson B.,	.....	1901 Arch street,	.....	Philadelphia.
Fry, Wilbur W.,	.....	1753 S. 16th St.,	.....	Philadelphia.
Fuller Philo,	.....	Tioga,	.....	Tioga county.
Fulmer, Geo. W.,	.....	York,	.....	York county.
Funk, Lawson C.,	.....	4099 Lancaster avenue,	.....	Philadelphia.
Furman, Frank R.,	.....	Hazleton,	.....	Luzerne county.
Gabell, C. P.,	.....	5338 Lancaster avenue,	.....	Philadelphia.
Gabel Samuel M.,	.....	305 W. Market street,	.....	York.
Gabler, Theo. A.,	.....	4320 Main street,	.....	Manayunk.
Gabriel, Cassius H.,	.....	Spartansburg,	.....	Crawford county.
Gabrio, Frank P.,	.....	416 North Broad street,	.....	Hazleton.
Gadd, Samuel W.,	.....	1155 South Eighth street,	.....	Philadelphia.
Galbraith, Wm. H.,	.....	Main and Jefferson Sts.,	.....	Germantown.
Gallagher, James F.,	.....	544 North Front street,	.....	Allentown.
Gallagher, James T.,	.....	247 South Tenth street,	.....	Philadelphia.
Gallaschick, Paul H.,	.....	23rd and Market Sts.,	.....	Philadelphia.
Gamble, David,	.....	Jonestown,	.....	Mercer county.

Gamble, Frank M.,	Jonestown,	Mercer county.
Gamble, John M.,	Shire Oaks,	Washington county.
Gano, Wm. H. Jr.,	17th and Columbia Ave.,	Philadelphia.
Gant, Joseph S.,	Buena Vista,	Allegheny county.
Gantz, John A.,	Lebanon,	Lebanon county.
Garber, Thos. P.,	Greenville,	Mercer county.
Gardner, John H.,	Stoyestown,	Somerset county.
Garland, John K.,	1560 Dickson avenue,	Scranton.
Garman, J. S.,	Berlin,	Somerset county.
Garretson, Joel R.,	1807 N. 21st St.,	Philadelphia.
Garrison, Joel, Jr.,	Williamsport,	Lycoming county.
Garrow, Harry,	405 N. 12th St.,	Philadelphia.
Gartland, Albert A.,	124 Third avenue,	Altoona.
Garver Walter J.,	Armat and Willow Ave.,	Germantown.
Gasaway John R.,	North ave., & Federal st.,	Allegheny.
Gatchel, Edmund R.,	1000 Spring Garden St.,	Philadelphia.
Geary, J. Frank,	Jersey Shore,	Lycoming county.
Gebhardt, E. W.,	2833 Howard street,	Philadelphia.
Geiger, Walter S.,	Eighth and Penn streets,	Reading.
Geissenhainer, H. E.,	Pittsburg,	Allegheny county.
Gelbert, Daniel G.,	402 S. Washington Ave.,	Scranton.
George, Charles T.,	1306 North Third street,	Harrisburg.
George, James M.,	McKeesport,	Allegheny county.
Gerhard, Alfred Y.,	2262 North Seventh street,	Philadelphia.
Gerhard, Luther,	Front and Susq'a Ave.,	Philadelphia.
Gerhard, Samuel,	Hanover & Belgrade sts.,	Philadelphia.
Gerhard, Wm. H.,	Hanover & Belgrade sts.,	Philadelphia.
Gerry, Elbridge H.,	Shrewsbury	York county.
Gerry, James,	Shrewsbury,	York county.
Gery, Ambrose M.,	Coopersburg,	Lehigh county.
Genther, Frederick E.,	2441 North Second street,	Philadelphia.
Gibble, Elmer E.,	3357 North Fifth street,	Philadelphia.
Gibboney Wm. M.,	Belleville,	Mifflin county.
Gibson, Clifford W.,	614 Walnut street,	McKeesport.
Gibson, Hlester F.,	2148 Green street,	Philadelphia.
Glebner, Robert E.,	Sandy Lake,	Mercer county.
Giffard, Wm. H.,	915 Locust street,	Philadelphia.
Gilbert, Frank L.,	Knoxville,	Tloga county.
Gilbert Wm. E.,	Harrison Valley,	Potter county.
Gill, Chas. A.,	29th and Diamond Sts.,	Philadelphia.
Gillespie, Chas. B.,	Freeport,	Armstrong county.
Gillispie, E. N.,	Freeport,	Armstrong county.
Gillespie, Wallace G.,	1836 Tasker street,	Philadelphia.
Gillette, Lester C.,	Towanda,	Bradford county.
Gillette Orville R.,	North East,	Erie county.
Gillis, Claudius V.,	Kane,	McKean county.
Gillis, James H.,	Kane,	McKean county.
Gingrich, Edward H.,	511 Cumberland street,	Lebanon.
Gingrich, Ezra H.,	3210 Frankford avenue,	Philadelphia.
Givens, Chas. A.,	McKees Rocks,	Allegheny county.
Glamser, Anton,	Sewickley,	Allegheny county.
Glassford, Samuel J.,	Penn Run,	Indiana county.
Gleim, Adolph,	1417 Clearfield street,	Philadelphia.
Gleim, Francis H. E.,	Lebanon,	Lebanon county.

Gleim, Perry M.,	38 Allegheny avenue,	Allegheny.
Glenn, Wm. S.,	State College,	Centre county.
Glover, Joseph E.,	Little Cooley,	Crawford county.
Goehrig, Thos. M.,	525 East Third street,	Williamsport.
Goehrig, Wm.,	525 East Third street,	Williamsport.
Goehring, John G.,	114 Main street,	West Newton.
Goess, Geo. C. Jr.,	Roxborough,	Philadelphia.
Goff, Wm. B.,	Wellsboro,	Tioga county.
Goldaine, James T.,	6th Ave., & Smithfield St.,	Pittsburg.
Goldsmith, Edwin R.,	Tarentum,	Allegheny county.
Goldsmith, Geo. W.,	7th and Thompson Sts.,	Philadelphia.
Goldsmith, Henry B.,	West Newton,	Westmoreland county.
Goldsmith, Lee,	2649 Marshall street,	Philadelphia.
Goll, Phillip,	21st and Montgomery Ave.,	Philadelphia.
Good, Adrianna,	5130 Tacony street,	Frankford.
Good, Benj. M.,	720 Berks street,	Philadelphia.
Good, Harvey J. T.,	803 Hamilton street,	Allentown.
Good, Wm. F. P.,	917 Turner street,	Allentown.
Goodlin, Elmer E.,	Saltsburg,	Indiana county.
Goodman, Edward E.,	812 Eighth avenue,	Altoona.
Goodwin, John W.,	Bennett,	Allegheny county.
Goodyear, M. S.,	4256 Regent square,	Philadelphia.
Goos, Chas.,	Third and Brown streets,	Philadelphia.
Gordon, Frank,	5 South Main street,	Pittston.
Gordon, Frederick T.,	2957 Ella street,	Philadelphia.
Gordon, John F.,	Rochester,	Beaver county.
Gordon, Willis G.,	Towanda,	Bradford county.
Gordon, Wm. H.,	4262 Frankford avenue,	Philadelphia.
Gordon, Wm. T.,	Rochester,	Beaver county.
Gorgas, Geo. A.,	16 North Third street,	Harrisburg.
Gorman, Patrick J.,	South Bethlehem,	Northampton county.
Gosh, Elizabeth J.,	Danville,	Montour county.
Gosh, Wm. E.,	Danville,	Montour county.
Gosser, J. J.,	Emlenton,	Venango county.
Gossling, Thos. R.,	1000 S. 17th St.,	Philadelphia.
Gotwalt, S. Horace,	113 South Beaver street,	Philadelphia.
Gould, John R.,	Berwick,	Columbia county.
Gracey, A. A.,	2249 N. 28th St.,	Philadelphia.
Grady, Geo. W.,	Norristown,	Montgomery county.
Graf, Chas. L.,	170 Washington avenue,	Allegheny.
Graff, Emil,	1900 Girard avenue,	Philadelphia.
Graham, Edward W.,	Clearfield,	Clearfield county.
Graham, Frank R.,	Shiloh and Sycamore Sts.,	Pittsburg.
Graham, Geo. M.,	Buttercup,	Butler.
Graham, Geo. P. G.,	818 Wylie avenue,	Pittsburg.
Graham, John D.,	4301 Butler street,	Pittsburg.
Graham, Robert,	Brownsville,	Fayette county.
Grahame, Geo. H.,	28 N. 12th St.,	Philadelphia.
Granger, Lewis E.,	Rush,	Susquehanna county.
Grant, Ulysses S.,	13th and Race Sts.,	Philadelphia.
Graver, James D.,	Royers Ford,	Montgomery county.
Graves, Frank M.,	Jermyn,	Lackawanna county.
Graves, John M.,	Jermyn,	Lackawanna county.
Gray, Alexander R.,	Jenkintown,	Montgomery county.

Gray, J. Frank, .....	Jersey Shore, .....	Lycoming county.
Grayson, John L., .....	Mercersburg, .....	Franklin county.
Green, Chas. V., .....	117 Main street, .....	Bradford.
Green, Chas. W., .....	Easton, .....	Northampton county.
Green, B. Wallace, .....	5th and Wharton Sts., ....	Philadelphia.
Green, Elisha, .....	Plumville, .....	Indiana county.
Green, Francis P., .....	Bellefonte, .....	Centre county.
Green, Howard L., .....	28th and Columbia Ave., ..	Philadelphia.
Green, J. Harris, .....	Bellefonte, .....	Centre county.
Green, John W., .....	Kinzua, .....	Warren county.
Green, Phillip H., .....	384 North Ninth street, ..	Reading.
Green, Thos. A., .....	Bradford, .....	McKean county.
Green, Wm. V., .....	348 North Ninth street, ..	Reading.
Greenawald, Benj. S., ....	Pottsville, .....	Schuylkill county.
Greenawalt, D. G., .....	Chambersburg, .....	Franklin county.
Greenawalt, Wm. G., ....	Chambersburg, .....	Franklin county.
Greene, Ellsworth H., ....	Chadds Ford, .....	Delaware.
Greene, Frank N., .....	2536 North Sixth street, ..	Philadelphia.
Greenfield, Lewis T., ....	518 Smithfield street, ....	Pittsburg.
Greenman, Dexter, .....	New Hamburg, .....	Mercer county.
Greenville, Thos. B., ....	Tunkhannock, .....	Wyoming county.
Greer, Harry L., .....	130 Main street, .....	Greensburg.
Gregory, Herbert T., ....	Wyoming, .....	Luzerne county.
Gregory, John E., .....	Gordon, .....	Schuylkill county.
Greineisen, F. C., .....	192 Main street, .....	Pittsburg.
Gress, Edward, .....	Pitcairn, .....	Allegheny.
Griesemer, John C., ....	801 Penn street, .....	Reading.
Griffin, John C., .....	917 North Main street, ..	Scranton.
Griffith, Albert R., .....	Oil City, .....	Venango county.
Griffith, Alfonso D., ....	Oil City, .....	Venango county.
Griffith, Edward J., ....	Oil City, .....	Venango county.
Griffith, Fred. T., .....	Oil City, .....	Venango county.
Griffith, John L., .....	Taylorville, .....	Lackawanna county.
Griffith, John W., .....	Kane, .....	McKean county.
Griffith, Joseph T., .....	Schuylkill Haven, .....	Schuylkill county.
Griffith, Thos. B., .....	Montoursville, .....	Lycoming county.
Griffith, Wm. C., .....	Marion Centre, .....	Indiana county.
Griffith, Wm. H., .....	Oil City, .....	Venango county.
Grinshaw, James B., ....	Duryea, .....	Luzerne.
Griswold, Chas. M., ....	1249 Bailey street, .....	Harrisburg.
Groff, Frank B., .....	44th and Lancaster Ave., ..	Philadelphia.
Groff, John A., .....	322 North Sixth street, ..	Reading.
Groff, John C., .....	Mount Joy, .....	Lancaster county.
Grohmann, E. J. C., ....	Butler, .....	Butler county.
Groom, Ellerslie W., ....	Bristol, .....	Bucks county.
Groome, John C., .....	Carlisle, .....	Cumberland county.
Gross, C. L., .....	Pen Argyl, .....	Northampton county.
Gross, Edward Z., .....	119 Market street, .....	Harrisburg.
Gross, Louis M., .....	1445 South Second street, ..	Philadelphia.
Gross, Michael J., .....	459 Fifth avenue, .....	McKeesport.
Grossman, Robert J., ....	Butler, .....	Butler county.
Grotevent, Fred., .....	1133 South Broad street, ..	Philadelphia.
Grotz, Milton, .....	2429 Frankford avenue, ..	Philadelphia.
Grove, John E., .....	17th and Reed Sts., ....	Philadelphia.

Grove, Meredith E.,	Freeland,	Luzerne county.
Grove, Warren W.,	Luzerne,	Luzerne county.
Grover, John D.,	Front and Catharine Sts.,	Philadelphia.
Grube, Geo. W.,	Lindsey,	Jefferson county.
Grube, Joseph M.,	Lindsey,	Jefferson county.
Gruhler, Christian,	Sixth and Race streets,	Philadelphia.
Gruhler, Martin,	Shenandoah,	Schuylkill county.
Grunewald, J. T.,	52 S. 12th St.,	Philadelphia.
Grubbins, Chas. H.,	15th and Race Sts.,	Philadelphia.
Guest, Samuel S.,	613 North Fourth street,	Philadelphia.
Gulse, P. Nettleton,	U. S. Naval Hospital,	Philadelphia.
Gunn, C. T.,	Springboro,	Crawford county.
Gutellus, Edwin S.,	2921 Penn street,	Pittsburg.
Gutellus, Mrs. Lydia E.,	2921 Penn street,	Pittsburg.
Guth, Harry L.,	2901 Carson street,	Pittsburg.
Guthrie, Clinton,	38th and Aspen Sts.,	Philadelphia.
Haak, Harry C.,	41 Cedar avenue,	Scranton.
Hackenberger, Geo. W.,	Bainbridge,	Lancaster county.
Hackenberger, G. W. Jr.,	Bainbridge,	Lancaster county.
Hackett, Henry J.,	27 North Second street,	Philadelphia.
Hackney, Geo. W.,	6203 Penn avenue,	Pittsburg.
Hadley, Harry C.,	Kennett Square,	Chester county.
Haenchen, Emil F.,	3844 Haverford avenue,	Philadelphia.
Hoering, David,	115 Juniata street,	Allegheny.
Hagenbuch, Chas. H.,	Shenandoah	Schuylkill county.
Hagenbuch, James H.,	101 West Centre street,	Mahanoy City.
Hague, Wm. H.,	6219 Pennsylvania avenue,	Pittsburg.
Hahn, Edward T.,	South Easton,	Northampton county.
Hahn, Herman F.,	915 North Third street,	Harrisburg.
Hahn, John H.,	20th and Federal Sts.,	Philadelphia.
Halg, Chas. R.,	1901 Master street,	Philadelphia.
Halg, Chas. R. Jr.,	1901 Master street,	Philadelphia.
Hainer, Robert M.,	New Castle,	Lawrence county.
Haines, Chas. A.,	Le Roy,	Bradford.
Haines, Chas. H.,	601 S. 13th St.,	Philadelphia.
Haines, Oliver B. J.,	813 Hamilton street,	Allentown.
Hair, Edward,	Roaring Springs,	Blair county.
Hair, Wilson E.,	Roaring Springs,	Blair county.
Haley, John B.,	New Castle,	Lawrence county.
Hall, Chas. H.,	327 South Main street,	Wilkes-Barre.
Hall, J. Barclay,	Norristown,	Montgomery county.
Hall, Peter,	630 State street,	Erie.
Hall, J. Willis,	Sayre,	Bradford county.
Hall, Robert C.,	Franklin,	Venango county.
Hall, Thos. M.,	561 Main street,	Johnstown.
Hall, Wm. D. W.,	527 Reed street,	Philadelphia.
Hamaker, Daniel H.,	122 Market street,	Harrisburg.
Hamberg, Samuel T.,	Ninth and Somerset Sts.,	Frankford.
Hamilton, Chas E.,	130 North Tenth street,	Philadelphia.
Hamilton, John,	Shousetown	Allegheny county.
Hamilton, Sylvester S.,	Punxsutawney,	Jefferson county.
Hamilton, Thos. J.,	34 Ohio street,	Allegheny.
Hamilton, Walter S.,	1015 Race street,	Philadelphia.
Hamilton, Wm. H.,	2274 Secon avenue,	Pittsburg.



Hamilton, Wm. M.,	.....34 Ohio street,	Allegheny.
Hamilton, Willis M. D.,	..Kennett Square,	Chester county.
Hamman, Wm. E.,	.....201 Northampton street,	Easton.
Hammond, Arthur B.,	... West Chester,	Chester county.
Hammond, Chas. M.,	..... West Chester,	Chester county.
Hammond, C. N.,	.....Bentley Creek,	Bradford county.
Hammond, Samuel K.,	... West Chester,	Chester county.
Haney, Mary A.,	.....Norristown,	Montgomery county.
Hannan, Frank W.,	.....1202 Race street,	Philadelphia.
Hansmann, Geo.,	.....2076 East Dauphin street,	Philadelphia.
Harbaugh, W. L.,	.....Haverford,	Montgomery.
Harbold, Curtis A.,	.....2621 Girard avenue,	Philadelphia.
Hard, James I.,	.....513 Chestnut street,	Sunbury.
Harders, Mac. Thos.,	.....801 S. Broad street,	Philadelphia.
Harding, Henry,	.....Mt. Pleasant Mills,	Snyder county.
Harding, Henry,	.....10th and Lombard Sts.,	Philadelphia.
Harding, Sanford,	.....Milton,	Northumberland county.
Hardy, Geo.,	.....315 Smithfield street,	Pittsburg.
Hardy, Robert J.,	.....Carnegie,	Allegheny county.
Hare, Albert,	.....815 Fifth avenue,	McKeesport.
Hargrave, Omar P.,	.....Duquesne,	Allegheny county.
Harkins, James,	.....Mt. Pleasant,	Westmoreland county.
Haring, George V.,	.....Junlata and Chartiers,	Allegheny.
Haring, Henry G.,	.....7th and Diamond Sts.,	Philadelphia.
Harner, Fernando R.,	... Port Royal,	Junlata county.
Harpel, Luther G.,	.....524 North Seventh street,	Lebanon.
Harrigan, John W.,	.....2600 Federal street,	Philadelphia.
Harris, Chas. M.,	.....125 Penn avenue,	Scranton.
Harris, Clarence M.,	.....2059 N. 13th St.,	Philadelphia.
Harris, Daniel M.,	.....4000 Girard avenue,	Philadelphia.
Harris E. Park,	.....West Chester,	Chester county.
Harris, Geo. W.,	.....1947 Christian street,	Philadelphia.
Harris, J. C.,	.....Venango,	Crawford county.
Harris, Marshall D.,	.....Bradford,	McKean county.
Harris, Norton O.,	.....541 Pine street,	Philadelphia.
Harris, Wm.,	.....Hamburg,	Berks county.
Harris, Wm.,	.....2041 Pine street,	Philadelphia.
Harrison, F. E.,	.....Ridley Park,	Delaware county.
Harry, James W.,	.....Sharon,	Mercer county.
Hart, DeForest,	.....Bradford,	McKean county.
Hart, Geo. F.,	.....628 Campbell street,	Williamsport.
Hart, Joseph A.,	.....153 West Girard avenue,	Philadelphia.
Hart, Lewis W.,	.....Cumberland,	Maryland.
Hart, W. D.,	.....Bradford,	McKean county.
Harter, Walter E.,	.....West Nanticoke,	Luzerne county.
Hartman, Frank G.,	.....430 North Lime street,	Lancaster.
Hartman, Harry Y.,	.....Orwigsburg,	Schuylkill county.
Hartman, J. Kabel,	.....West Chester,	Chester county.
Hartman, Steele G.,	.....Indiana,	Indiana county.
Hartung, Carl E. B.,	.....1615 Ann street,	Pittsburg.
Hartwell, Samuel,	.....Coudersport,	Potter county.
Hartwig, Carl,	.....4016 Butler street,	Pittsburg.
Hartzell, Alfred K.,	.....835 Linden street,	Allentown.
Hartzell, Wm. L.,	.....2649 Germantown avenue,	Philadelphia.

Harvey, Chas. B.,	Kennett Square,	Chester county.
Harvey, Elisha G.,	Lewisburg,	Union county.
Harvey, N. C.,	Phillipsburg,	Centre.
Hassinger, S. E. R.,	23rd and Fairmount Ave.,	Philadelphia.
Hatfield, Mrs. Lena E.,	Tunkhannock,	Wyoming county.
Hatfield, Samuel G.,	Tunkhannock,	Wyoming county.
Hatfield, Supple S.,	Tunkhannock,	Wyoming county.
Hause, Geo. S.,	York,	York county.
Hause, Robert M.,	York,	York county.
Hausmann, Fred'k W.,	600 West Girard avenue,	Philadelphia.
Haverstick, Joseph B.,	7 South Hanover street,	Carlisle.
Haviland, Sanford C.,	Erie,	Erie county.
Hay, Chas. L.,	Du Bois,	Clearfield county.
Hay, Harry A.,	Market and Pine streets,	York.
Hay, John W.,	1402 North Third street,	Harrisburg.
Haydock, Susannah G.,	2147 Locust street,	Philadelphia.
Hayes, James F.,	1233 Walnut street,	Philadelphia.
Hayes, John C.,	1001 Wylie avenue,	Pittsburg.
Hayes, John W.,	Edwardsdale,	Luzerne county.
Hayes, Robert G. H.,	Bellefonte,	Centre county.
Hayes, Wm. D. E.,	Shippensburg,	Cumberland county.
Hayhurst, Susan,	22nd and College Ave.,	Philadelphia.
Hays, Joseph A.,	147 S. 18th St.,	Pittsburg.
Hazlett, Alfred W.,	Tarentum,	Allegheny county.
Headley, Harry H.,	Bristol,	Bucks county.
Healy, Joseph,	409 S. 22nd St.,	Philadelphia.
Heard, Mary K.,	North East,	Erie county
Hebsacker, Wm. F.,	531 West York street,	Philadelphia.
Hack, Emile E.,	517 Penn avenue,	Pittsburg.
Hack, Fred. H.,	Freeport,	Armstrong county.
Heckel, Henry W.,	68 Middle street,	Allegheny.
Heckenberger, Wm.,	Catasauqua,	Lehigh county.
Hecker, Jacob K.,	932 N. 30th St.,	Philadelphia.
Heckerman, Adam B.,	Bedford,	Bedford county.
Heckerman, Edward D.,	Bedford,	Bedford county.
Heckerman, Matthew P.,	Bedford,	Bedford county.
Heckler Franklin J.,	Columbia,	Lancaster county.
Heerlein, Arno W.,	Tarentum,	Allegheny county.
Heffley, Harry B.,	364 Bedford street,	Johnstown.
Heffner, Edgar F.,	Centralia,	Columbia county.
Helberger, Eugene S.,	29th and Herman Sts.,	Philadelphia.
Hedges, Wm. S.,	110 E. Market St.,	York.
Hellman, Amos B.,	Duquesue,	Allegheny county.
Hellman, Robert B.,	Lebanon,	Lebanon county.
Helm, Henry L.,	522 Diamond street,	Philadelphia.
Helm, Wm. J.,	2805 Germantown avenue,	Philadelphia.
Heinitsh, Chas A.,	16 East King street,	Lancaster.
Heinitsh, Sigmund W.,	16 East King street,	Lancaster.
Heintzelman, J. A.,	2000 Ridge avenue,	Philadelphia.
Heintzelman, R. W.,	Tower City,	Schuylkill county.
Heiser, Edwin S.,	Lewisburg,	Union county.
Heiser, Elmer E.,	Bethlehem,	Northampton county.
Heiser, Willis D.,	Mifflinburg,	Union county.
Helstand, Wm. H.,	519 Seigel street,	Philadelphia.

Heitshu, Daniel H.,	311 North Queen street,	Lancaster.
Hilpert, Wm.,	2040 Lawrence street,	Philadelphia.
Helfrich, L. S.,	4818 Woodland avenue,	Philadelphia.
Heller, J. A.,	Factoryville,	Wyoming county.
Hellwig, Hattie E.,	Austin,	Potter county.
Hellwig, Geo. D.,	Austin,	Potter county.
Hellyer, Edwin F.,	Penns Park,	Bucks county.
Helm, Gustave C. F. Jr.,	Third and Morris streets,	Philadelphia.
Henderson, Archie K.,	300 Frankstown avenue,	Pittsburg.
Henderson, Edward B.,	Brookville,	Jefferson county.
Henderson, Fred B.,	Brookville,	Jefferson county.
Henderson, Randal W.,	1220 Fourth avenue,	Beaver Falls.
Henderson, Robert H.,	18 North Third street,	Chester.
Henderson, Wm. W.,	Butler,	Butler county.
Hendrickson, Chas. P.,	1745 N. 22nd St.,	Philadelphia.
Henkel, Luther S.,	1012 Pine street,	Philadelphia.
Henritzy Oscar E.,	249 N. 12th St.,	Philadelphia.
Henry, Geo. S.,	Duncannon,	Perry county.
Henry, Samuel C.,	61st and Lombard Sts.,	Philadelphia.
Henszey, Samuel C.,	34th and Hamilton Sts.,	Philadelphia.
Henwood, Chas.,	1909 Main avenue,	Scranton.
Henwood, Sidney R.,	1909 Main avenue,	Scranton.
Hepler, Albert J.,	Fairmount City,	Clarion county.
Herbert, Thos. L.,	3001 Richmond street,	Philadelphia.
Herbert, Fred J.,	5th and Cumberland Sts.,	Philadelphia.
Hergeshelmer, David S.,	Devon,	Chester county.
Hering, Edwin A.,	906 Seventh avenue,	Altoona.
Herman, Wm. F.,	1926 Carson street,	Pittsburg.
Hermann, Theo. J.,	Hamilton,	Butler county.
Herr, Elias B.,	334 East King street,	Lancaster.
Herrmann, Ernest W.,	716 Race street,	Philadelphia.
Hersh, Alfred C.,	12th and Lehman Sts.,	Lebanon.
Hertel, Fred'k G.,	8th and Girard avenue,	Philadelphia.
Hertel, Julius E.,	801 North Third street,	Philadelphia.
Herwirsch, Chas.,	1702 N. 28th St.,	Philadelphia.
Hess, Edwin H.,	1530 Ridge avenue,	Harrisburg.
Hess, Harry R.,	301 North Ninth street,	Philadelphia.
Hess, Harvey F.,	Bethlehem,	Northampton county.
Hess, James M.,	East Mauch Chunk,	Carbon county.
Hess, Lemuel B.,	Shamokin,	Northumberland county.
Hess, Miles R.,	2864 North Fifth street,	Philadelphia.
Hesske, August R.,	13th and Poplar Sts.,	Philadelphia.
Hetherington, Thos.,	2209 Frankford avenue,	Philadelphia.
Hetrick, D. A.,	Indiana,	Indiana county.
Hetrick, R. D.,	Indiana,	Indiana county.
Hewitt, Andrew C.,	Nicetown,	Philadelphia.
Hewitt, Chas. E.,	1224 Spruce street,	Philadelphia.
Hewitt, Lemuel E.,	Wylie Ave. and Fulton St.,	Pittsburg.
Heyl, Fred'k W.,	722 S. 22nd St.,	Philadelphia.
Hickman, Thos. E.,	Wayne,	Delaware county.
Hickman, Wm. H. Jr.,	336 South Second street,	Philadelphia.
Hieber, Geo. A.,	1747 Fifth avenue,	Pittsburg.
Hieber, Theo. W. D.,	1251 Penn avenue,	Pittsburg.
Hiestand, Daniel,	221 North Eighth street,	Allentown.

Hiestand, John S.,	665 N. 15th St.,	Philadelphia.
Higbee, Wm. S.,	544 Tasker street,	Philadelphia.
Higgate, Wilford O.,	822 N. 41st St.,	Philadelphia.
Higgins, Jonathan M.,	1961 Germantown ave.,	Philadelphia.
Hildebrand, Henry H.,	Worth,	Mercer county.
Hildebrand, Louis W.,	2401 East York street,	Philadelphia.
Hildebrand, Thos. E.,	Indiana,	Indiana county.
Hildebrand, Walter E.,	Indiana,	Indiana county.
Hille, Isaiah W.,	Sunbury,	Northumberland county.
Hileman, Geo. F.,	Dallas,	Luzerne county.
Hill, Geo. S.,	Sayre,	Bradford county.
Hill, Jacob F.,	Nanticoke,	Luzerne county.
Hill, Justin L.,	Williamsport,	Lycoming county.
Hill, Samuel H.,	Corry,	Erie county.
Hill, Smith W.,	Hope Church,	Allegheny county.
Hill, Wm. M.,	23rd and Callowhill Sts.,	Philadelphia.
Hillan, John M.,	13th and Market Sts.,	Philadelphia.
Hillegas, Oliver J.,	1206 North Sixth street,	Harrisburg.
Hiller, W. L.,	Penn Building,	Pittsburg.
Hillier, Joseph W.,	West Middlesex,	Mercer county.
Hilton, Henry B.,	Kittanning,	Armstrong county.
Hilton, Thos. C.,	Lock Haven,	Clinton county.
Himmelberger, H. W.,	Jonestown,	Lebanon county.
Himmelwight, F. E.,	313 Diamond street,	Philadelphia.
Hine, Marks P.,	Houtzdale,	Clearfield.
Hines, John P.,	Stoneboro,	Mercer county.
Hines, Joseph,	Athens,	Bradford county.
Hines, P. H. T.,	3047 Lawrence street,	Philadelphia.
Hines, Sabrina A.,	Athens,	Bradford county.
Hindman, Homer C.,	West Sunbury,	Butler county.
Hinkle, Samuel W.,	Third and Locust streets,	Columbia.
Hinkson, Wm. E.,	Princeton,	New Jersey.
Hiorns, Lucien F.,	Scranton,	Lackawanna county.
Hixenbaugh Wm. S.,	65 Rebecca street,	Allegheny.
Hoagland Wm. J.,	Hazleton,	Luzerne county.
Hoch, Aquila,	1634 Columbia avenue,	Philadelphia.
Hoch, Jacob,	3913 Lancaster avenue,	Philadelphia.
Hoch, Wm. S.,	Orange and Pine streets,	Lancaster.
Hodge, Wm. R.,	1017 Arch street,	Philadelphia.
Hodgkins, Chas. W.,	Patton,	Cambria county.
Hodgkins, Israel M.,	Dravosburg,	Allegheny county.
Hodgson, James N.,	22 North Centre street,	Pottsville.
Hodgson, Thos. S.,	Rochester,	Beaver county.
Hodil, Frank D.,	Sligo,	Clarion county.
Hodil, James J.,	Sharpsburg,	Allegheny county.
Hodil, John S.,	155 Buena Vista street,	Allegheny.
Hoduett, Alfred T. G.,	25 East Princess street,	York.
Hoehn, Wm.,	Mt. Pleasant,	Westmoreland county.
Hoetel, Frederick,	2683 Frankford avenue,	Philadelphia.
Hoey, Albert M.,	Bridgeville,	Allegheny.
Hoffa, Chas. W.,	Dushore,	Sullivan county.
Hoffa, J. Wilson,	1342 North Sixth street,	Harrisburg.
Hoffecker, Luther R.,	3108 Ridge avenue,	Philadelphia.
Hoffman, C. F.,	528 Arch street,	Philadelphia.

1. Name of Person	John J. Smith	1917
2. Address	123 Main St., New York	1917
3. Age	35	1917
4. Sex	Male	1917
5. Occupation	Teacher	1917
6. Date of Birth	Jan. 1, 1882	1917
7. Date of Death	Dec. 31, 1917	1917
8. Cause of Death	Heart Disease	1917
9. Place of Death	New York	1917
10. Name of Physician	Dr. J. H. Jones	1917
11. Name of Undertaker	John Doe	1917
12. Name of Burial Place	St. John's Church	1917
13. Name of Coroner	John Doe	1917
14. Name of Jury	John Doe	1917
15. Name of Judge	John Doe	1917
16. Name of Sheriff	John Doe	1917
17. Name of Constable	John Doe	1917
18. Name of Notary	John Doe	1917
19. Name of Witness	John Doe	1917
20. Name of Juror	John Doe	1917
21. Name of Juror	John Doe	1917
22. Name of Juror	John Doe	1917
23. Name of Juror	John Doe	1917
24. Name of Juror	John Doe	1917
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98. Name of Juror	John Doe	1917
99. Name of Juror	John Doe	1917
100. Name of Juror	John Doe	1917

Hossler, David A.,	167 Washington avenue,	Allegheny.
Hostetter, Andrew G.,	172 North Queen street,	Lancaster.
Houck, Joseph H.,	Pittston,	Luzerne county.
Houck, Paul W.,	Shenandoah,	Schuylkill county.
Hough, John W.,	513 N. 4 <sup>th</sup> St.,	Philadelphia.
Houghton, J. C.,	20 West King street,	Lancaster.
Housekeeper, A. K.,	840 N. 19 <sup>th</sup> St.,	Philadelphia.
Howard, Carrie E.,	1601 Christian street,	Philadelphia.
Howard, John E.,	1411 Market street,	Harrisburg.
Howard, J. Griffith,	2649 Germantown avenue,	Philadelphia.
Howarth, Robert, Jr.,	516 Market street,	Chester.
Howarth, Wm. G.,	516 Market street,	Chester.
Howd, Fay F.,	Wellsboro,	Tioga county.
Huber, Chas. F.,	6130 Penn avenue,	Pittsburg.
Huber, James H.,	Harmony,	Butler.
Huber, John M.,	Gettysburg,	Adams county.
Huber, Milton,	5 East Market street,	Williamsport.
Huber, Solomon R.,	Jersey City,	New Jersey.
Hubley, Alfred A.,	30 West King street,	Lancaster.
Hubley, John H.,	16 <sup>th</sup> and Race Sts.,	Philadelphia.
Huddleson, Frank W.,	4154 Lancaster avenue,	Philadelphia.
Hudson, Alonzo G.,	Safe Harbor,	Lancaster county.
Hudson, Frank E. E.,	2722 N. 11 <sup>th</sup> St.,	Philadelphia.
Huebner, Geo. W.,	642 Main street,	Johnstown.
Hugg, Willis P.,	Sayre,	Bradford county.
Hughes, Frank S.,	15 <sup>th</sup> and Oxford Sts.,	Philadelphia.
Hughes, Isaac N.,	Canonsburg,	Washington county.
Hughes, L. B.,	5100 Penn avenue,	Pittsburg.
Hughes, Wm.,	290 Beaver avenue,	Allegheny.
Hugus, Richard T.,	619 Clay avenue,	Jeannette.
Hukill, Oscar K.,	11 <sup>th</sup> and Pine Sts.,	Philadelphia.
Hulbert, Wm. H.,	Sheakleyville,	Mercer county.
Hull, Chas. S.,	4 <sup>th</sup> Ave., & Smithfield St.,	Pittsburg.
Hull, Geo. W.,	23 West King street,	Lancaster.
Hull, Morris A.,	Manayunk,	Philadelphia.
Hulshizer, Martin,	Doylestown,	Bucks county.
Humes, Robert D.,	West Newton,	Westmoreland county.
Hunma, Henry J.,	100 North Tenth street,	Reading.
Hummel, Alice,	Kratzerville,	Snyder county.
Hummel, Azima A.,	Kratzerville,	Snyder county.
Hummel, David F.,	21 <sup>st</sup> and Ridge Ave.,	Philadelphia.
Humphrey, David W.,	1413 Pittston avenue,	Scranton.
Humphrey, Wm. J.,	Union City,	Erle.
Humphreys, Robert F.,	Irwin,	Westmoreland county.
Hunnell, Bird S.,	Tarantum,	Allegheny county.
Hunt, Geo. E.,	Fairview,	Erle county.
Hunt, G. Shoop,	West Chester,	Chester county.
Hunter, Henry B.,	106 Cherry street,	Philadelphia.
Hunter, James E.,	Battle Creek,	Allegheny county.
Hunter, Samuel V.,	1834 North Fifth street,	Philadelphia.
Hunter, W. A.,	At. Leach,	Huntingdon county.
Huntman, Howard D.,	332 Berklomen street,	Philadelphia.
Hurl, Michael E.,	1500	Clearfield county.
Hurley, D. G.,	110 <sup>th</sup> Ave., and 1 <sup>st</sup> St.,	Altoona.

Husband, Thos. J. Jr.,	...3rd and Spruce Sts.,	..... Philadelphia.
Huston, Frank,	..... Uniontown,	..... Fayette county.
Huston, James,	..... 1755 N. 13th St.,	..... Philadelphia.
Huston, James L.,	..... Ninth and Ferry streets,	..... Easton.
Hutchison, B. T.,	..... Stroudsburg,	..... Monroe.
Hutchison, David W.,	..... Downingtown,	..... Chester county.
Hutton, David S.,	..... Smithton,	..... Westmoreland county.
Hutton, James C.,	..... New Castle,	..... Lawrence county.
Hyatt, Erwin,	..... Johnsonburg,	..... Elk county.
Hyde, Alfred C.,	..... Mahonington,	..... Lawrence county.
Hyde, Chas. W.,	..... Sharon,	..... Mercer county.
Hyde, James M.,	..... 5501 Walnut street,	..... Pittsburg.
Hyde, Wm. W.,	..... West Middlesex,	..... Mercer county.
Hyers, Eugene E.,	..... Wellsboro,	..... Tioga county.
Hyers, Percy,	..... 1231 Arch street,	..... Philadelphia.
Iaeger, Samuel T.,	..... 16 S. 15th St.,	..... Reading.
Ihrig, Theo. E.,	..... 3610 Fifth avenue,	..... Pittsburg.
Infield, Thos. H.,	..... Sandy Lake,	..... Mercer county.
Ingram, Geo. T.,	..... Wyalusing,	..... Bradford.
Ingram, Theo. E.,	..... Marietta,	..... Lancaster county.
Ink, Lemuel W.,	..... 1374 Second avenue,	..... Pittsburg.
Innes, John C.,	..... Bellwood,	..... Blair county.
Innes, Wilson J.,	..... Bridgeville,	..... Allegheny county.
Irwin, Robert H.,	..... St. Clair,	..... Schuylkill county.
Irvine, Reed,	..... Bedford,	..... Bedford county.
Irving, Robert C.,	..... Ogdensburg,	..... Tioga county.
Irwin John F.,	..... Clearfield,	..... Clearfield county.
Irwin Joseph R.,	..... Curwensville,	..... Clearfield county.
Irwin, Wm. H.,	..... 11th Ave. and 16th St.,	..... Altoona.
Isard, Geo. W.,	..... 3629 Haverford avenue,	..... Philadelphia.
Ischler, Geo. H.,	..... 619 York street,	..... Philadelphia.
Jackel, John O.,	..... 1340 S. 7th St.,	..... Philadelphia.
Jackson, Andrew,	..... 1500 N. 5th St.,	..... Harrisburg.
Jackson, Geo. H.,	..... Seventh and Arch streets,	..... Philadelphia.
Jackson, J. Benson,	..... New Buffalo,	..... Perry county.
Jackson, John W.,	..... Arnot,	..... Tioga county.
Jackson, Robert W.,	..... 21st and Locust Sts.,	..... Philadelphia.
Jackson, S. H. Jr.,	..... 823 Wood street,	..... Wilkesburg.
Jackson, Thomas,	..... 2900 Germantown avenue,	..... Philadelphia.
Jackson, Wm. H.,	..... New Buffalo,	..... Perry county.
Jacob, Chas. P.,	..... 1106 Chestnut street,	..... Philadelphia.
Jacob, Walter B.,	..... 1027 Arch street,	..... Philadelphia.
Jacobs, Irwin B.,	..... Hollidaysburg,	..... Blair county.
Jacobs, John P.,	..... Hollidaysburg,	..... Blair county.
Jacobs, Theodore,	..... 363 East Main street,	..... Norristown.
Jacobs, Thos. J.,	..... Somerfield,	..... Somerset county.
Jacobson, Frank E.,	..... Bethlehem,	..... Northampton county.
Jacoby, Cyrus,	..... South Bethlehem,	..... Northampton county.
Jadwin, C. C.,	..... Honesdale,	..... Wayne county.
Jadwin, Henry B.,	..... Carbondale,	..... Lackawanna county.
James, Edmund,	..... Ebensburg,	..... Cambria county.
James, G. W. C.,	..... Orbisonia,	..... Huntingdon county.
James, Henry H.,	..... Parsons,	..... Luzerne county.
James, J. W.,	..... East Brady,	..... Clarion.

James, Robert R.,	123 South Lincoln avenue,	Scranton.
Jameson, David,	3rd and Catharine Sts.,	Philadelphia.
Jamison, John C.,	Irwin,	Westmoreland county.
Jamison, Samuel C.,	59 Fulton street,	Pittsburg.
Javens, Thos. H.,	Rochester,	Beaver county.
Jeffries, James A.,	7206 Germantown avenue,	Philadelphia.
Jenkins, E. P.,	Six Mile Run,	Bedford county.
Jenkins, Geo. W.,	101 South Main avenue,	Scranton.
Jenkins, John L.,	1234 Academy street,	Scranton.
Jenkins, Wm. H.,	Hughesville,	Lycoming.
Jenkins, Wm. W.,	717 Jackson street,	Scranton.
Jenks, Wm. E.,	428 South Fortieth street,	Philadelphia.
Jenks, Wm. J.,	4043 Market street,	Philadelphia.
Jessop, Chas. J.,	Kittanning,	Armstrong county.
Jessop, Samuel A. S.,	Kittanning,	Armstrong county.
Jewell, Thos. H.,	Pulaski,	Lawrence county.
John, Frank J.,	Charleroi,	Washington county.
John, Harry J.,	3621 Fifth avenue,	Pittsburg.
John, Hilbert B.,	242 Chestnut street,	Philadelphia.
Johnson, Benj. F.,	301 East Girard avenue,	Philadelphia.
Johnson, Elmer E.,	Lost Creek,	Schuylkill county.
Johnson, Geo. H.,	913 Kurtz street,	Philadelphia.
Johnson, Hussey B.,	1107 Third avenue,	New Brighton.
Johnson, Samuel C.,	Blooming Valley,	Crawford county.
Johnson, Wm. A.,	220 Vine street,	Philadelphia.
Johnson, Wm. D.,	Le Raysville,	Bradford county.
Johnson, W. M.,	Venetia,	Washington county.
Johnson, Wm. W.,	326 West Second street,	Chester.
Johnston, A. R.,	New Bloomfield,	Perry county.
Johnston, Frank E.,	Moore,	Delaware county.
Johnston, Cyrus H.,	New Milford,	Susquehanna county.
Johnston, Cyrus S.,	Harford,	Susquehanna county.
Jolly, Geo. L.,	Orangeville,	Columbia county.
Jones, Chas. F.,	Stevensville,	Bradford county.
Jones, Chas. P.,	Scranton,	Lackawanna county.
Jones, C. Lyston,	Chestnut Hill,	Philadelphia.
Jones, Daniel G.,	Taylor,	Lackawanna.
Jones, David M.,	512 South Main street,	Scranton.
Jones, Fred'k H.,	Laceyville,	Lycoming county.
Jones, Geo. D.,	770 Passyunk avenue,	Philadelphia.
Jones, Henry E.,	1801 N. 8th St.,	Philadelphia.
Jones, James M.,	700 North Tenth street,	Reading.
Jones, John H.,	430 Fifth avenue,	Pittsburg.
Jones, John R.,	Jermyn,	Lackawanna county.
Jones, Joseph H.,	320 Lackawanna avenue,	Scranton.
Jones, Lester D.,	725 South Tenth street,	Philadelphia.
Jones, Nathan,	430 Fifth avenue,	Pittsburg.
Jones, P. Lawrence,	Hazelwood and 2nd Ave.,	Pittsburg.
Jones, Thos. Howell,	130 South Main avenue,	Scranton.
Jones, Wm. H.,	2432 N. 16th St.,	Philadelphia.
Jones, Wm. R.,	1101 Diamond street,	Philadelphia.
Jones, Wm. S.,	1153 Liberty street,	Pittsburg.
Jones, Wm. W.,	1330 Green street,	Philadelphia.
Jordon, Frank W.,	Bedford,	Bedford county.



Jordon, Frank W.,	Tacony,	Philadelphia.
Jorden, Adelbert S.,	Mt. Carmel,	Northumberland.
Jordy, Geo. H.,	103 East Princess street,	York.
Joslin, Henry H.,	Ulster,	Bradford county.
Judd, Albert F.,	Beaver,	Beaver county.
Judd, James F.,	1801 Orthodox street,	Philadelphia.
Judge, John A.,	2814 Edgemont street,	Philadelphia.
Jump, Harvey D.,	Sayre,	Bradford county.
Jungmann, Emil,	220 Vine street,	Philadelphia.
Kaercher, Albert J.,	62 Federal street,	Allegheny.
Kahl, Chas. W.,	236 Fifth avenue,	McKeesport.
Kahle, Chas. E.,	Butler,	Butler county.
Kahle, D. B.,	New Kensington,	Westmoreland county.
Kalbach, Chas. P.,	Bernville,	Berks county.
Kalbach, Harry A.,	509 North Seventh street,	Philadelphia.
Kalmbach, Henry G.,	Mervine and Norris Sts.,	Philadelphia.
Kalston, Geo. F.,	2652 Ann street,	Philadelphia.
Kamerer, Geo. F.,	Greenville,	Mercer county.
Kane, Frank A.,	Minooka,	Lackawanna.
Kane, James F.,	62 N Washington St.,	Wilkes-Barre.
Kane, John S.,	Fredonia,	Mercer.
Kantner, Harry B.,	1018 12th St.,	Altoona.
Kantz, T. Clayton,	Selinsgrove,	Snyder county.
Karcher, James D.,	3264 Chestnut street,	Philadelphia.
Karsner, Chas. W.,	1409 S. 15th St.,	Philadelphia.
Kasson, Myron,	Montrose,	Susquehanna county.
Kasten, W. J.,	Boiling Springs,	Cumberland county.
Katzenmeyer, Henry A.,	171 Chestnut street,	Allegheny.
Kauffman, John R.,	8 East Orange street,	Lancaster.
Kauffman, Walter L.,	Leaman Place,	Lancaster county.
Kaufman, Chas.,	Danville,	Montour county.
Kaye, John,	26th and Brown Sts.,	Philadelphia.
Keck, Frank P.,	Laury Station,	Lehigh county.
Keegan, Harry H.,	1548 S. 20th St.,	Philadelphia.
Keeler, Chas. E.,	40th and Locust St.,	Philadelphia.
Keeler, Joseph P.,	650 Wharton street,	Philadelphia.
Keet, Frank S.,	433 Market street,	Harrisburg.
Keil, John J.,	Etna,	Allegheny county.
Kelm, Asher D.,	71 Broad street,	Bethlehem.
Kelper, Harvey L.,	145 North Seventh street,	Allentown.
Kelchner, Chas. E.,	29th and Callowhill, Sts.,	Philadelphia.
Kelchner, Chas. F.,	47 North Eighth street,	Philadelphia.
Kellenberger, Fred J.,	303 Fulton street,	Pittsburg.
Keller, Alexander G.,	161 North Second street,	Philadelphia.
Keller, Christian K.,	45 Market street,	Harrisburg.
Keller, Croll,	45 Market street,	Harrisburg.
Keller, Frederic R.,	1812 South Fourth street,	Philadelphia.
Keller, John W.,	Ashley,	Luzerne county.
Keller, Wm.,	Munson Station,	Clearfield county.
Kelley, Chas. M.,	1317 Forbes street,	Pittsburgh.
Kelley, John J.,	140 Hanover street,	Philadelphia.
Kelley, M. L.,	McKeesport,	Allegheny county.
Kellner, Henry C. F.,	137 E. Montgomery street,	Philadelphia.
Kelly, Bernard A.,	Carbondale,	Lackawanna county.

Kelly, Cassius H.,	819 Penn avenue,	Pittsburgh.
Kelly, Edgar E.,	Oil City,	Venango county.
Kelly, Francis B.,	Oil City,	Venango county.
Kelly, Francis P.,	Carbondale,	Lackawanna county.
Kelly, Harry E.,	Parkers Landing,	Armstrong county.
Kelly, James H.,	Manito,	Westmoreland.
Kelly, Joseph H.,	Carbondale,	Lackawanna county.
Kelly, Leonard,	Olyphant,	Lackawanna county.
Kelly, Nancy H.,	Pleasant Unity,	Westmoreland county.
Kelly, Patrick M.,	20th and Federal streets,	Philadelphia.
Kelly, Robert J.,	112 Market street,	Philadelphia.
Kelly, Russel E.,	Danville,	Montour county.
Kelly, Wm. C.,	South Chester,	Delaware county.
Kemble, Chas.,	Tidionte,	Warren county.
Kemble, Grant W.,	Titusville,	Crawford county.
Kemble, Wm. W.,	Tidionte,	Warren county.
Kemmerer, N. H.,	Emaus,	Lehigh county.
Kempsmith, Paul,	Bethlehem,	Northampton.
Kenah, Chas. J.,	10 North Broadway,	New Brighton.
Kenah, Roland L.,	New Brighton,	Beaver county.
Kendall, Perry G.,	Waterford,	Erie county.
Kendig, Allen J.,	16th and Brown streets,	Philadelphia.
Kennard, John B.,	Clearfield,	Clearfield county.
Kennedy, Albert D.,	Eleventh and South streets,	Philadelphia.
Kennedy, Alexander,	11th and Girard avenue,	Philadelphia.
Kennedy, Geo. W.,	Pottsville,	Schuylkill county.
Kennedy, Wm.,	1236 S. 15th street,	Philadelphia.
Kennedy, Wm. H.,	30 S. Third street,	Harrisburg.
Kennedy, Wm. P.,	Priceburg,	Lackawanna.
Kenney, Joseph W.,	360 Main street,	Bradock.
Kenworthy, John,	Coatesville,	Chester county.
Kephart, Thos. A. C.,	Ford City,	Armstrong.
Kepler, Daniel C.,	Lansdale,	Montgomery county.
Kepner, John C.,	Chester,	Delaware county.
Kercher, Edwin H.,	728 N. Seventh street,	Philadelphia.
Kern, Franklin,	3875 Aspen street,	Philadelphia.
Kern, James B.,	2204 N. 18th street,	Philadelphia.
Kerr, James, Jr.,	6th ave. and Smithfield st.,	Pittsburgh.
Kerr, John H.,	2580 Frankford avenue,	Philadelphia.
Kerr, John W.,	Rimersburg,	Ciaron county.
Kerr, Joseph M.,	Stroudsburg,	Monroe county.
Kerr, Milton C.,	Blairsville,	Indiana county.
Kerr, Perry L.,	Mars,	Butler county.
Kerr, Wm. D.,	Conshohocken,	Montgomery county.
Kervey, Harry R.,	West Chester,	Chester county.
Kessler, Edward F.,	2317 Spring Garden street,	Philadelphia.
Kester, Elias P.,	Lopez,	Sullivan county.
Ketring, David F.,	Williamsburg,	Blair county.
Kieffer, Chas. C.,	50 East Main street,	Carlisle.
Kieffer, Otto D.,	2138 Market street,	Philadelphia.
Kier, Harry M.,	11 Boggs avenue,	Pittsburgh.
Kiley, John H.,	Morris Run,	Tioga county.
Kilgore, E. P.,	Franklin,	Venango county.

Kilgus, John F.,	513 Maple place,	Williamsport.
Kilgus, Wm. M.,	800 Walnut street,	Philadelphia.
Killian, Chas. T.,	14 Centre street,	South Easton.
Kille, Geo. H.,	1233 S. 17th street,	Philadelphia.
Killough, Samuel M.,	Hummelstown,	Dauphin county.
Kindig, Isalah H. S.,	233 N. Second street,	Philadelphia.
King, Albert J.,	540 N. Tenth street,	Philadelphia.
King, Chas. E.,	2401 Master street,	Philadelphia.
King, Everett L.,	1900 Green street,	Philadelphia.
King, James C.,	Reynoldsville,	Jefferson county.
Kinnear, Wm. A.,	419 E. Water street,	Warren.
Kinney, John T.,	Braddock,	Allegheny county.
Kinsel, Grant A.,	91 Buena Vista street,	Allegheny.
Kirby, Clarence T.,	Towanda,	Bradford county.
Kirby, Chas. P.,	33rd and Chestnut streets,	Philadelphia.
Kirk, John H.,	510 W. Seventh street,	Chester.
Kirk, Lewis R., Jr.,	Malvern,	Chester.
Kirk, Samuel B.,	1400 Spruce street,	Philadelphia.
Kirkendall Chas. F.,	Main and Clinton streets,	Johnstown.
Kirlin, P. P. D.,	Shenandoah,	Schuylkill county.
Kishadden, Wm. J.,	Etna,	Allegheny county.
Kisner, Chas. N.,	Berwick,	Columbia county.
Kitzmiller, Frank K.,	1143 Derry street,	Harrisburg.
Klapp, Wm. H.,	Lock Haven,	Clinton county.
Kleckner, James,	Mifflinburg,	Union county.
Kleim, C. A.,	Bloomsburg,	Columbia county.
Kleim, H. F.,	Bloomsburg,	Columbia county.
Kleim, John H.,	Hanover,	York county.
Kline, Alvin B.,	64 Chestnut street,	Allegheny county.
Kline, Frank,	245 N. 12th street,	Philadelphia.
Kline, Harry H.,	600 Centre avenue,	Reading.
Kline, Harry J.,	146 N. Tenth street,	Philadelphia.
Kline, John,	Ashley,	Luzerne county.
Kline, Wm. O.,	Rice's Landing,	Greene county.
Kline, Willughby C.,	Myerstown,	Lebanon county.
Klinefelter, Chas.,	Factoryville,	Wyoming county.
Klingensmith, I. P.,	Blairsville,	Indiana county.
Klingler, John H.,	Ridge ave. and Brown st.,	Philadelphia.
Klonaski, W. S.,	5 South Main street,	Pittston.
Klopp, Eli L.,	Oak Lane,	Philadelphia.
Klopp, Henry L.,	1444 N. 19th street,	Philadelphia.
Klopp, Lewis C.,	12th and Christian streets,	Philadelphia.
Klopp, Peter P.,	2963 N. Sixth street,	Philadelphia.
Kloppenstein, J. A.,	Meadville,	Crawford county.
Knapp, Avery,	West Pittston,	Luzerne county.
Knapp, Philip P.,	Sewickley,	Allegheny county.
Knauer, August H.,	430 N. Ninth street,	Philadelphia.
Kneeshaw, Wm. W.,	Wissahickon,	Philadelphia.
Knepp, Andrew S.,	Lewistown,	Mifflin county.
Knerr, L. J.,	1576 Arch street,	Philadelphia.
Knight, Ambrose S.,	North Clarendon,	Warren county.
Knight, Elmer E.,	Carnegie,	Allegheny county.
Knisell, S. L.,	435 Arch street,	Philadelphia.
Knode, John C.,	1374 Second avenue,	Pittsburgh.

Knoepfel, Wm. H.,	1017 N. Irving avenue,	Scranton.
Knorr, John K., Jr.,	Girard and Susquehanna aves.,	Philadelphia.
Knorr, Victor C.,	Braddock,	Allegheny county.
Knouse, Jacob H.,	426 Market street,	Harrisburg.
Knowles, Geo. A.,	2211 Federal street,	Philadelphia.
Koch, Chas. H.,	764 Union street,	Philadelphia.
Koch, Eugene C. H.,	329 York avenue,	Philadelphia.
Koch, Harry W.,	5705 Germantown avenue,	Philadelphia.
Koch, Julius A.,	Bluff and Pride streets,	Pittsburgh.
Koch, Louis,	329 N. Fourth street,	Philadelphia.
Kocher, David G.,	1801 S. Fifteenth street,	Philadelphia.
Koempel, Chas.,	501 Linden street,	Scranton.
Koenig, Albert,	807 N. Third street,	Philadelphia.
Koenig, Wm. M.,	945 N. Sixth street,	Philadelphia.
Kohler, Chas.,	2501 N. Tenth street,	Philadelphia.
Kolb, Chas. A.,	46 Western avenue,	Allegheny.
Kolb, Isadore,	15th and Tasker streets,	Philadelphia.
Kolp, Jacob L.,	10th and Buttonwood sts.,	Philadelphia.
Kooker, Geo. W.,	Green and Rittenhouse sts.,	Philadelphia.
Kooker, Jacob G.,	Norristown,	Montgomery county.
Kooker, John L.,	351 Armat street,	Germantown.
Koons, Milton H.,	Fifth and Gordon,	Allentown.
Koons, Wm. H.,	Norris and Camac streets,	Philadelphia.
Kornacher, Wm.,	724 Pittston avenue,	Scranton.
Kottcamp, Abraham,	1711 Sumer street,	Philadelphia.
Kottka, Ray W.,	437 Green street,	Philadelphia.
Kraeling, Adolph H.,	Dunbar,	Fayette county.
Kramer, Chas. F.,	Third and Broad streets,	Harrisburg.
Kramer, Homer D.,	1223 Grandview avenue,	Philadelphia.
Kramer, Ira D. W.,	461 Richmond street,	Philadelphia.
Kramer, Jere R.,	106 S. Centre street,	Pottsville.
Kramer, Matthew,	309 S. Ninth street,	Scranton.
Kratz, Annetta,	Lansdale,	Montgomery county.
Kratz, Mahlon,	Main and Mannheim streets,	Germantown.
Kraus, Otto,	2901 Poplar street,	Philadelphia.
Krauser, John H.,	1432 Willington street,	Philadelphia.
Krauser, Daniel M.,	Milton,	Northumberland county.
Krauser, Ellis,	Milton,	Northumberland county.
Krauskoff, Geo. H.,	8 Granville street,	Pittsburgh.
Krebs, A. Bryan,	Lilly,	Cambria.
Krebs, Harry J.,	Mahanoy City,	Schuylkill county.
Krebs, Jacob S.,	Herndon,	Northumberland county.
Krecker, Wm. H.,	2233 N. 16th street,	Philadelphia.
Kredel, Geo.,	Johnstown,	Cambria county.
Krehan, Frank,	Marshalsea,	Allegheny county.
Kreider, Frank L.,	Lebanon,	Lebanon county.
Krels, Arnold C.,	Merrimac avenue,	Pittsburgh.
Kreitzel, Michael C.,	1536 N. Fourth street,	Philadelphia.
Kremer, Walter H.,	6010 Main street,	Germantown.
Kressler, Geo. D.,	South Bethlehem,	Northampton county.
Kretz, Edward J. W.,	359 Webster avenue,	Pittsburgh.
Krewson, Wm. E.,	1836 Franklin street,	Philadelphia.
Krey, Louis A.,	286 Ohio street,	Allegheny.
Krider, James D.,	1709 Sydenham street,	Philadelphia.

Krum, Thos. E.,	223 N. Sixth street,	Reading.
Kuehn, Gustave A. A.,	357 Scott street,	Wilkes-Barre.
Kuhn, Arthur J.,	Homestead,	Allegheny county.
Kuhn, Chas. L.,	Mt. Pleasant,	Westmoreland county.
Kuhn, Gustav O. Jr.,	803 N. 15th street,	Philadelphia.
Kuhn, Milton S.,	Mt. Pleasant,	Westmoreland county.
Kuhn, Paul,	501 Second avenue,	Pittsburgh.
Kuhns, Edwin J.,	213 Radcliffe street,	Bristol.
Kulp, Wm. A.,	Phillipsburg	Centre county.
Kunkel, D. L.,	2455 Howard street,	Philadelphia.
Kunkel, Wm. E.,	Columbia,	Lancaster county.
Kunkel, Wm. E.,	Newberry,	Lycoming.
Kunkel, Wm. H.,	Newberry,	Lycoming.
Kunkel, Timothy O.,	Peale,	Clearfield county.
Kunz, John R.,	Washington,	Washington county.
Kusenberg, Louis C.,	Jasper and Huntingdon,	Philadelphia.
Kutscher, Geo. W.,	Graddock,	Allegheny county.
Kutzner, John D.,	33 Public Square,	Wilkes-Barre.
Kyle, Elmer B.,	2999 Kensington avenue,	Philadelphia.
Lacey, Wm. H.,	1900 Green street,	Philadelphia.
Laciar, Joseph,	Mauch Chunk,	Carbon county.
Lackenmayer, H. J.,	2618 Susquehanna avenue,	Philadelphia.
Lackey, Richard H.,	1772 Frankford avenue,	Philadelphia.
La Dow, Addington,	2301 Christian street	Philadelphia.
Laessle, Henry A.,	31st and Berks streets,	Philadelphia.
Lafean, Albert H.,	4 W. Market street,	York.
Lafean, Edward C.,	4 W. Market street,	York.
Lafferty, Jacob E.,	543 S. Centre street,	Pottsville.
Lafferty, Archie J.,	Somerset and Reese sts.,	Philadelphia.
Lafferty, Chas. D.,	Second and Green streets,	Philadelphia.
Lafferty, J. H.,	New Florence,	Westmoreland county.
Lafferty, John H.,	Sharon,	Mercer county.
Lake, Erastus E.,	Shamokin,	Northumberland county.
Lalley, Peter F.,	Randham,	Lackawanna county.
Lamb, D. Hadley,	Emporium,	Cameron county.
Lambert, Geo. T.,	16th and Chestnut streets,	Philadelphia.
Lambert, Herbert G.,	800 Walnut street,	Philadelphia.
Landis, Chas. P.,	4218 Peckin street,	Philadelphia.
Landis, Frank T.,	Homestead,	Berks county.
Landis, Isaac R.,	3522 Germantown avenue,	Philadelphia.
Landis, Josiah,	Manheim,	Lancaster county.
Landis, J. Wm.,	365 Cherry street,	Philadelphia.
Lane, Daniel F.,	Bellefonte,	Centre county.
Lane, Homer K.,	Ulysses,	Potter county.
Lang, Geo. P.,	144 Madison avenue,	Allegheny.
Lang, Henry,	Belle Vernon,	Fayette county.
Lange, Kennedy F.,	2705 Butler street,	Pittsburgh.
Lange, Wood H.,	Belle Vernon,	Fayette county.
Lantz, Wm. H.,	2458 N. Second street,	Philadelphia.
Larkins, Chas. T.,	273 Second street,	East Liverpool.
Larry, Samuel,	232 Arch street,	Allegheny.
Larue, Willis L.,	4089 Lancaster avenue,	Philadelphia.
Lasheld, Peter W.,	2600 Josephine street,	Pittsburgh.
Lashelle, Chas. L.,	Glen Riddle,	Delaware county.

Lathrop, Walter, .....	Miner's Mills, .....	Luzerne county.
Lau, Scott W., .....	1629 Walnut street, .....	Philadelphia.
Laubach, Stephen, .....	Easton, .....	Northampton county.
Laubach, Wm. H. Jr., ...	Broad and Girard avenue, .....	Philadelphia.
Laufman, Albert, .....	Wilkinsburg, .....	Allegheny county.
Laurent, Augustus G., ..	736 S. Third street, .....	Philadelphia.
Lautenbacher, Irvin L., ..	Schuylkill Haven, .....	Schuylkill county.
Lautenbacher, Wm. R., ..	2450 N. Sixth street, .....	Philadelphia.
Laverty, Chas. K., .....	Harrisburg, .....	Dauphin county.
Laverty, Eugene C., .....	Middletown, .....	Dauphin county.
Laverty, Theo. C., .....	Middletown, .....	Dauphin county.
Law, Wm., .....	Avoca, .....	Luzerne county.
Lawell, Chas. E., .....	Catasauqua, .....	Lehigh county.
Lawall, Chas. H., .....	Bloomsburg, .....	Columbia county.
Lawall, Edgar J., .....	Bloomsburg, .....	Columbia county.
Lawall, Walter S., .....	437 Northampton street, .....	Easton.
Lawrence, Henry R., ....	11th and Locust streets, .....	Philadelphia.
Lawrence, Mary L., ....	Port Carbon, .....	Schuylkill county.
Lawrence, Samuel C., ....	Scottdale, .....	Westmoreland county.
Lawrence, Wm. E., .....	Beaver, .....	Beaver county.
Lawson, Geo. S., .....	613 N. Fourth street, .....	Philadelphia.
Lawton, Henry C., .....	146 N. Twentieth street, .....	Philadelphia.
Le Bar, Anizi, .....	Stroudsburg, .....	Monroe county.
Leber Jacob G., .....	York, .....	York county.
Leffingwell, James G., ....	Newburg, .....	Cumberland county.
Lee, Wm. E., .....	23:7 Brown street, .....	Philadelphia.
Leedom, Chas., .....	1403 Filbert street, .....	Philadelphia.
Leeser, Wm., .....	Sunbury, .....	Northumberland county.
Lefevre, Acton A., .....	250 S. Queen street, .....	Lancaster.
Leffingwell, James G., ....	Conneautville, .....	Crawford county.
Legg, Geo. A., .....	Honesdale, .....	Wayne county.
Leh, Geo. D., .....	16 S. Linden street, .....	Philadelphia.
Lehman, Fred'k C., .....	1700 N. 25th St., .....	Philadelphia.
Lehman, Joseph D., .....	4256 Main street, .....	Manayunk.
Lehr, J. Frank, .....	2445 Ridge avenue, .....	Philadelphia.
Leidich, Percy G., .....	Front and Vine streets, .....	Harrisburg.
Leighty, Eli C., .....	West Newton, .....	Westmoreland county.
Leine, Arthur M., .....	Honesdale, .....	Wayne county.
Leister, Harry W., .....	18th and Jefferson streets, .....	Philadelphia.
Leitch, Chas. T., .....	Quakertown, .....	Bucks county.
Leltzell, Chas. B., .....	Derry Station, .....	Westmoreland county.
Leix, Louis, .....	1329 Third avenue, .....	Altoona.
Lemberger, Joseph L., ....	Lebanon, .....	Lebanon county.
Lenhardt, Oliver F., ....	Swede and Airy streets, .....	Norristown.
Leniger, Oscar M., .....	Danville, .....	Montour county.
Leonard, Hannah E., ....	Hadley, .....	Mercer county.
Leonard, Isaac E., .....	White Haven, .....	Luzerne county.
Leonard, John F., .....	78 Mechanic street, .....	Bradford.
Leonard, Robert P., .....	White Haven, .....	Luzerne county.
Leshner, Edwin C., .....	17th and Norris streets, .....	Philadelphia.
Leshner, John B., .....	Williamstown, .....	Dauphin county.
Leslie, David A., .....	New Kensington, .....	Westmoreland.
Letzkens, Wm. G., .....	Children's Hospital, .....	Philadelphia.
Levering, Howard M., ....	4554 Washington street, .....	Manayunk.

Lewis, Chas. A.,	Elizabeth,	Allegheny county.
Lewis, Daniel E.,	Edwardsville,	Luzerne county.
Lewis, Elmer L.,	East Berlin,	Adams county.
Lewis, Fisher A.,	2457 Kensington avenue,	Philadelphia.
Lewis, Lohn J.,	Mt. Carmel,	Northumberland county.
Lewis, Llewellyn H.,	9th and Somerset streets,	Philadelphia.
Lewis, Nathan N.,	128 E. Broad street,	Hazleton.
Lewis, Thos. J.,	Mahanoy City,	Schuylkill county.
Lewis, Thos. S.,	Oakmont,	Allegheny county.
Lewis, Wm. H.,	Mt. Carmel,	Northumberland county.
Lewis, Wm. T.,	42d and Westminster ave.,	Philadelphia.
Libhart, Anthony C.,	Marietta,	Lancaster county.
Libhart, Samuel H.,	Marietta,	Lancaster county.
Life, J. C.,	1123 Spruce street,	Philadelphia.
Liggett, Samuel J.,	936 W. Somerset street,	Philadelphia.
Lilly, Howard H.,	2525 N. Twelfth street,	Philadelphia.
Linderman, R. J.,	2809 N. Broad street,	Philadelphia.
Lindsey, Chris R.,	Mercer,	Mercer county.
Lindsley, Ransom G.,	Corry,	Erie county.
Lingle, Milton D.,	2521 Jessup street,	Philadelphia.
Lingle, Reuben D.,	1010 Chestnut street,	Reading.
Linn, Geo. T.,	Monogahela City,	Washington county.
Linn, J. Madison,	California,	Washington county.
Linn, Max C.,	5201 Butler street,	Pittsburgh.
Linn, Wm. E.,	1615 S. Broad street,	Philadelphia.
Lippen, Harry,	Manayunk,	Philadelphia.
Lippmann, Max,	1607 Ridge avenue,	Philadelphia.
Lisenring, Gibson H.,	Glen Campbell,	Indiana county.
List, Joshua M.,	Evans City,	Butler county.
Lits, Walter K.,	4451 Frankford avenue,	Philadelphia.
Little, Geo.,	Tamaqua,	Schuylkill county.
Livezey, John B.,	Doylestown,	Bucks county.
Livezey, Richard W.,	Doylestown,	Bucks county.
Livingood, Albert J.,	210 Penn street,	Reading.
Llewellyn, John J.,	Kingsston,	Luzerne county.
Llewellyn, Wm. H.,	1410 Chestnut street,	Philadelphia.
Lloyd, James E.,	101 Queen street,	Northumberland.
Lloyd, Richard L.,	1606 Mt. Vernon street,	Philadelphia.
Lloyd Wm. E.,	Olyphant,	Lackawanna county.
Locher, Mrs. Margaret,	9 E. King street,	Lancaster.
Lochman, Chas. N.,	Bethlehem,	Northampton county.
Lochman, Wm. J.,	412 N. Seventh street,	Allentown.
Loch, John H.,	2401 E. Huntingdon street,	Philadelphia.
Lockhart, Joseph R.,	Freedom,	Beaver county.
Loder, Alex K.,	946 E. Fifth street,	Philadelphia.
Loder, C. G. A.,	1539 Chestnut street,	Philadelphia.
Loehle, John F.,	Lebanon,	Lebanon county.
Loeper, Chas. P.,	1229 S. 21st street,	Philadelphia.
Loftus, John J.,	237 Wyoming avenue,	Scranton.
Lohmeyer, Henry L.,	1901 Carson street,	Pittsburgh.
Lomax, F. F.,	Monroeton,	Bradford county.
Long, Chas. B.,	390 Rebecca street,	Allegheny.
Long, Chas. E.,	126 N. Duke street,	Lancaster.
Long, Chas. H.,	2480 Emerald street,	Philadelphia.

Long, James G.,	2231 Vine street,	Philadelphia.
Long, John N. G.,	29th and Diamond streets,	Philadelphia.
Long, Robert P.,	Mechanicsburg,	Cumberland county.
Long, Samuel S.,	19 S. George street,	York.
Long, Wm. H. Jr.,	1300 Fitzwater street,	Philadelphia.
Long, Wm. W.,	300 N. Third street,	Lewisburg.
Loop, Geo. D.,	North East,	Erie county.
Lorah, James R.,	316 N. Tenth street,	Philadelphia.
Lorah, Lester I.,	Greensburg,	Westmoreland.
Lorch, Carl P.,	1718 Carson street,	Pittsburgh.
Lorw, Anna,	Norristown,	Montgomery county.
Lorenz, Carl,	418 Lackawana avenue,	Scranton.
Lorman, M. F.,	1501 Dickinson street,	Philadelphia.
Lorman, W. Ellwood,	Passyunk & Wash'n aves.,	Philadelphia.
Lostetter, Wm. H.,	660 N. Eighth street,	Erie.
Louderbough, F. P.,	672 N. Tenth street,	Philadelphia.
Loughlin James E.,	Norwood,	Delaware county.
Loughridge, J. Daniel,	434 Penn avenue,	Pittsburgh.
Loughridge, Samuel S.,	4th and Indian avenue,	Philadelphia.
Louther, J. M.,	Somerset,	Somerset county.
Love, Jesse B.,	New Castle,	Lawrence county.
Love, J. Harry,	146 N. Tenth street,	Philadelphia.
Love, Sylvester M.,	Rixford,	McKean county.
Low, Wm.,	Glenwood, 23d ward,	Pittsburgh.
Lowe, Clement B.,	1120 Mt. Vernon street,	Philadelphia.
Lowe, James W.,	Girard,	Erie county.
Lowe, Samuel A.,	Scottdale,	Westmoreland county.
Lowenberg, Joseph,	201 Washington avenue,	Scranton.
Lucas, Harry C.,	624 Smithfield street,	Pittsburgh.
Luerssen, Frank,	1410 Chestnut street,	Philadelphia.
Luks, Emil C.,	Royersford,	Montgomery county.
Luks, Robert A.,	Royersford,	Montgomery county.
Lupin, Emanuel,	St. Clement's Hospital,	Philadelphia.
Lupus, Herman E.,	22d and Berks streets,	Philadelphia.
Lutz, Henry O.,	4301 Butler street,	Pittsburgh.
Lutz, Horace C.,	19 N. Main street,	Wilkes-Barre.
Lutz, Irwin B.,	Blainesport,	Lancaster county.
Lutz, Isaac D.,	Harrisburg,	Dauphin county.
Lutz, Walter P.,	Salem,	New Jersey.
Lutz, Wm. D.,	6378 Main street,	Germantown.
Lydell, James,	Cambridgeboro,	Crawford county.
Lynch, Chas. A.,	Elizabeth,	Allegheny county.
Lynch, Wm. C.,	Pittsburg,	Allegheny county.
MacCracken, E. G.,	612 N. 13th street,	Philadelphia.
Mack, James W.,	Slatington,	Lehigh county.
Mack, John S.,	Slatington,	Lehigh county.
Mackey, Harry W.,	Beaver Falls,	Beaver county.
Mackey, John W.,	221 Boas street,	Harrisburg.
MacInall, Edward,	261 S. 15th street,	Philadelphia.
MacIntosh, J. C.,	Erie,	Erie county.
MacKenzie, Robert W.,	563 Fifth avenue,	Pittsburgh.
Macmillan, Wm. C.,	Latrobe,	Westmoreland county.
MacNair, Edward D.,	Passyunk ave. & Moore st.,	Philadelphia.
Macphee, Thos. D.,	600 S. Broad street,	Philadelphia.



Madeira, Robert W.,	..... Sixth and Walnut streets,	Reading.
Mader, Elias,	..... Lebanon,	Lebenon county.
Maggini, A. P.,	..... Braddock,	Allegheny county.
Magill, Robert D.,	..... Danville,	Montour county.
Magowan, James D.,	..... Kane,	McKean county.
Maier, John,	..... 2631 Kensington avenue,	Philadelphia.
Main, Clinton E.,	..... Main and Pearl,	Norristown.
Main, Comer B.,	..... Union City,	Erie county.
Maine, Geo. D.,	..... Mainesburg,	Tioga county.
Maisch, Henry C. C.,	..... 854 N. Tenth street,	Philadelphia.
Maize, Chas. F.,	..... Queen and Morris streets,	Germantown.
Malphass, Wm. H.,	..... 4th and Chestnut streets,	Philadelphia.
Manchester, Joseph V.,	..... Carrolltown,	Cambria county.
Mangold, Ernest,	..... 64 Lowrie street,	Allegheny.
Manko, Emanuel,	..... 724 N. Eleventh street,	Philadelphia.
Manley, James A.,	..... 1418 Pittston avenue,	Scranton.
Manlove, Harry C.,	..... 1600 Pine street,	Philadelphia.
Mann, Wm. C.,	..... 603 N. Twelfth street,	Philadelphia.
Manning, Chas. L.,	..... Bound Brook,	New Jersey.
Maples, Murff F.,	..... Philadelphia,	Philadelphia.
Marchand, Samuel R.,	..... New Haven,	Fayette county.
Marcy, Chas. H.,	..... Tunkhannock,	Wyoming county.
Marcy, Wm. L.,	..... Dunmore,	Lackawanna county.
Maris, Robert W.,	..... 10th and Spruce street,	Philadelphia.
Markel, Chester F.,	..... 4th and Perry streets,	Columbia.
Markell, Frank E.,	..... Connellsville,	Fayette county.
Markell, S. C.,	..... Monongahela City,	Washington county.
Markell, W. Grayson,	..... 6219 Penn avenue,	Pittsburgh.
Markley, Wm. A.,	..... 239 Market street,	Harrisburg.
Marsh, Geo. E.,	..... Townville,	Crawford county.
Marshall, Archy S.,	..... Portersville,	Butler county.
Marshall, Daniel W.,	..... New Holland,	Lancaster county.
Marshall, Donaldson,	..... 112 Market street,	Philadelphia.
Marshall, Joseph D.,	..... 112 Market street,	Philadelphia.
Marshall, Robert C.,	..... West Fairview,	Cumberland county.
Marshall, Robert J.,	..... 112 Market street,	Philadelphia.
Marshall, Rush P.,	..... 16th and Race streets,	Philadelphia.
Marshall, Thos. D.,	..... Blairsville,	Indiana county.
Martin, Andrew E.,	..... Greensburg,	Westmoreland.
Martin, David G.,	..... New Holland,	Lancaster county.
Martin, Emlen,	..... Bristol,	Bucks county.
Martin, Geo.,	..... Conemaugh,	Cambria county.
Martin, Henry C.,	..... 42 East Vine street,	Lancaster.
Martin, Hugh H.,	..... Franklin,	Venango county.
Martin, John E.,	..... Jersey Shore,	Lycoming county.
Martin, Wm. C.,	..... 238 8th avenue,	Homestead.
Martindell, Wm. N.,	..... 306 Cherry street,	Philadelphia.
Martsof, Jacob H.,	..... Beaver,	Beaver county.
Martsof, Wm. P.,	..... New Brighton,	Beaver county.
Martz, Wm. K.,	..... Front and Pine streets,	Steelton.
Masholder, Jacob H.,	..... 28th and Master streets,	Philadelphia.
Mason, George W.,	..... Lock Haven,	Clinton county.
Masters, C. G.,	..... Everett,	Bedford county.
Matchett, C. R.,	..... Beaver,	Beaver county.

Mateer, J. Ross, .....	Altoona, .....	Blair county.
Mateer, Robt. B., .....	1106 Chestnut street, .....	Philadelphia.
Mateer, R. M., .....	Shelocta, .....	Indiana.
Mather, Chas. V., .....	Bear Lake, .....	Warren county.
Mathews, Wm. J., .....	1301 Columbia avenue, ....	Philadelphia.
Mathiott, Geo. H., .....	Mt. Jackson, .....	Lawrence county.
Matos, Louis A., .....	3943 Fairmount avenue, ...	Philadelphia.
Matson, Wm. F., .....	Punxsutawney, .....	Jefferson county.
Mattern, John W., .....	Philipsburg, .....	Centre county.
Mattern, Rolland B., ....	Franklin, .....	Venango county.
Mattern, Wm. K., .....	3602 Germantown avenue, ..	Philadelphia.
Matthews, Abel J., .....	York Road and Mill st., ..	Philadelphia.
Matthews, Chas. W., ....	320 Lackawanna avenue, ..	Scranton.
Matthews, Frank A., ....	21 North Eighth street, ...	Lebanon.
Matthews, Richard J., ....	Scranton, .....	Lackawanna county.
Matthews, W. L., .....	25th and Christian streets, ..	Philadelphia.
Mauch, Chas. M., .....	1013 Arch street, .....	Philadelphia.
Mauk, Geo. W., Jr., .....	Claysburg, .....	Blair county.
Maulick, Wm. F., .....	411 Locust street, .....	Columbia.
Maurer, Geo. B., .....	21st and Fitzwater streets, ..	Philadelphia.
Maxwell, Wm. P., .....	Troy, .....	Bradford county.
May, Geo. R., .....	Lebanon, .....	Lebanon county.
May, Rollin R., .....	2441 Brown street, .....	Philadelphia.
Mayer, Albert H., .....	54 North Tenth street, ...	Reading.
Mayer, Max B., .....	6622 Germantown avenue, ...	Philadelphia.
Mayer, Thos. E., .....	Lewistown, .....	Mifflin county.
Mayo, Fred. H., .....	31 McClure avenue, .....	Allegheny
McAllister, James A., ....	New Brighton, .....	Beaver county.
McAniff, Hugh P., .....	153 Lincoln street, .....	Wilkes-Barre.
McAtee, Wm. W., .....	Cresson, .....	Cambria county.
McBride, Homer J., .....	Federal and Ohio streets, ..	Allegheny.
McBride, James E., .....	South Bethlehem, .....	Northampton county.
McCain, Stuart B., .....	Rush, .....	Susquehanna county.
McCallister, Wm. C., ....	Monongahela City, .....	Washington county.
McCandless, Chas. S., ....	Homestead, .....	Allegheny county.
McCandless, E. S., .....	2017 N. Eleventh street, ..	Philadelphia.
McCarthy, P. T., .....	Oil City, .....	Venango county.
McCarthy, W. E., .....	4730 Liberty avenue, .....	Pittsburg.
McCartney, F. S., .....	823 W. Broad street, .....	Philadelphia.
McCartney, Warren C., ..	Coalport, .....	Clearfield county.
McCartney, Wm. B., ....	600 Liberty street, .....	Pittsburg.
McCarty, Robert H., ....	1010 Belmont avenue, .....	Philadelphia.
McCaskey, Cyrus A., ....	Bolivar, .....	Westmoreland county.
McCausland, R. J., .....	Montrose, .....	Susquehanna county.
McClaran, James F., ....	Sewickley, .....	Allegheny county.
McClaran, Joe. A., .....	Saltsburg, .....	Indian county.
McClaran, Sarah E., ....	Sewickley, .....	Allegheny county.
McClaran, Wm. L., ....	Sewickley, .....	Allegheny county.
McCleary, J. A., .....	615 Twelfth street, .....	Altoona.
McCleary, Samuel B., ....	37½ N. Prince street, .....	Lancaster.
McClelland, James B., ....	305 Market street, .....	Kittanning.
McClelland, James R., ....	81 Federal street, .....	Allegheny.
McClelland, John C., ....	Freeport, .....	Armstrong county.
McClintock, James, .....	Mt. Pleasant avenue, .....	Germantown.

McClintock, Wm. C.,	.....125 Market street,	.....Philadelphia.
McCloskey, C. E. R.,	.....123 Ohio street,	.....Philadelphia.
McCloskey, John B.,	.....Mill Hall,	.....Clinton county.
McCloskey, Willson C.,	.....1013 Spruce street,	.....Philadelphia.
McCloud, Benton,	.....Darlington,	.....Beaver county.
McCloud, Myron H.,	.....Darlington,	.....Beaver county.
McClure, Berthier,	.....10th and Reed streets,	.....Philadelphia.
McClure, Carlton E.,	.....New Castle,	.....Lawrence county.
McClure, Howard W.,	.....Hazleton,	.....Luzerne county.
McClure, Wm. P.,	.....Sheffield,	.....Warren county.
McComb, Alonzo D.,	.....Hawthorne,	.....Clarion county.
McConaughy Thos. S.,	.....Washington,	.....Washington county.
McConnell, James L.,	.....Leetsdale,	.....Allegheny.
McConnell, John C.,	.....New Milford,	.....Susquehanna county.
McCononry, Paul L.,	.....813 N. 21st street,	.....Philadelphia.
McCorkle, Wm.,	.....12th and Somerset streets,	.....Philadelphia.
McCormick, Blanche,	.....244 W. Kink street,	.....Lancaster
McCormick, D. H.,	.....Connellsville,	.....Fayette county.
McCormick, Harry C.,	.....Connellsville,	.....Fayette county.
McCormick, Henry C.,	.....Pen Argyl,	.....Northampton county.
McCormick, James H.,	.....Watsonstown,	.....Northumberland county.
McCormick, Sallie,	.....244 W. King street,	.....Lancaster.
McCoubrey, W. J.,	.....113 Federal street,	.....Allegheny.
McCouch, John W.,	.....720 S. 21st street,	.....Philadelphia.
McCoy, Henry L.,	.....Smethport,	.....McKean county.
McCoy, Thos. F.,	.....Conshohocken,	.....Montgomery
McCracken, James H.,	.....Darby,	.....Delaware county.
McCrea, James T.,	.....Creekside,	.....Indian county.
McCreary, Joseph R.,	.....559 Homewood avenue,	.....Pittsburg.
McCright, Chas.,	.....1358 Marlborough street,	.....Philadelphia.
McCreight, Robt.,	.....1340 Montgomery avenue,	.....Philadelphia.
McCullough, A. J.,	.....Sewickley,	.....Allegheny county.
McCullough, Clem B.,	.....Oxford,	.....Chester county.
McCullough, M. L.,	.....Oxford,	.....Chester county.
McCullough Peter A.,	.....4700 Penn avenue,	.....Pittsburg.
McCurdy, John A.,	.....Steelton,	.....Dauphin county.
McCurdy, Wilbur E.,	.....Burgettstown,	.....Washington county.
McDaniel, Harry,	.....Highspire,	.....Dauphin county.
McDonald, Chas. R.,	.....Whitney,	.....Westmoreland county.
McDonald, G. F.,	.....Gallitzin,	.....Cambria.
McDonald, John A.,	.....Reedsville,	.....Mifflin county.
McDonald, J. S.,	.....37 Stockton avenue,	.....Allegheny.
McDonald, Wm. A.,	.....Lewistown,	.....Mifflin county.
McDonnell, Chas. P.,	.....1603 S. Tenth street,	.....Philadelphia.
McElfresh, J. A.,	.....102 Seventh avenue,	.....Pittsburg.
McElhenny, Peter,	.....Pittston,	.....Luzerne county.
McElwee, Elmer J.,	.....Mt. Pleasant,	.....West moreland county.
McFadden, John J.,	.....1440 S. Twentieth street,	.....Philadelphia.
McFadden, Robert,	.....3201 Powelton avenue,	.....Philadelphia.
McFadden, Thos. F. J.,	.....34th and Pine streets,	.....Philadelphia.
McFarland, John R.,	.....Saltsburg,	.....Indiana county.
McFarland, W. S.,	.....Sharon,	.....Mercer county.
McFayden, Wm. T.,	.....410 W. Eighth street,	.....Erie.
McFeeters, Andrew J.,	.....4233 Lancaster avenue,	.....Philadelphia.

McFerran, J. D.,	12th and Race streets,	Philadelphia.
McGann, Michael J.,	398 Fifth avenue,	Pittsburg.
McGarr, Mrs. J. L.,	218 Market street,	Pittsburg.
McGarrah, Wm. H.,	Scranton,	Lackawanna county.
McGary, Robert M.,	Mechanicsburg	Cumberland county.
McGee, T. J.,	Lowry and Branch streets,	Allegheny.
McGee, Saylor J.,	520 N. Fifth street,	Philadelphia.
McGibbons, Harry,	Uniontown,	Fayette county.
McGinnes, John S.,	13 Grove street,	Lock Haven.
McGrew, Thos. B.,	Finleyville,	Washington.
McGuffin, Geo. L.,	New Castle,	Lawrence county.
McHale, Frank P.,	Dunmore,	Lackawanna county.
McHenry, Thos.,	63 Irwin avenue,	Allegheny.
McHenry, Walter G.,	2426 Adams street,	Philadelphia.
McIntosh, John R.,	3928 Market street,	Philadelphia.
McIntyre, Wm.,	2429 Frankford avenue,	Philadelphia.
McJunkin, W. L.,	Clearfield,	Clearfield county.
McKean, A. H.,	Beaver Falls,	Beaver county.
McKean, A. J.,	Mercer,	Mercer county.
McKee, David M.,	Etna,	Allegheny county.
McKee, Harry A.,	Homestead,	Allegheny county.
McKee, John L.,	Chicora,	Butler county.
McKee, Joseph A.,	1900 Green street,	Philadelphia.
McKee, Mrs. N. A.,	Plymouth,	Luzerne county.
McKee, Nannie E.,	Homestead,	Allegheny county.
McKelvy, Geo. A.,	Bloomsburg,	Union county.
McKeown, A. H. L.,	80 Washington avenue,	Pittsburg.
McKinley, John,	New Wilmington,	Lawrence.
McKinney, Robert A.,	Plain Grove,	Lawrence county.
McKinney, Wm. J.,	North Liberty,	Mercer county.
McKnight, Wm. A.,	Sharon,	Mercer county.
McLain, J. R.,	Claysville,	Washington county.
McLain, Wm. J. E.,	Claysville,	Washington county.
McLaughlin, Chas. B.,	Camden,	New Jersey.
McLaughlin, Geo. A.,	Delmont,	Westmoreland county.
McLaughlin, Philip C.,	1724 Poplar street,	Philadelphia.
McLean, C. N.,	Union City,	Erie county.
McLees, Warden J.,	740 W. Fourth street,	Williamsport.
McLure, John H.,	Prospect,	Butler county.
McMechen, W. B.,	3740 Lancaster avenue,	Philadelphia.
McMichael, James C.,	Warren,	Warren county.
McMichael, John D.,	Meadville,	Crawford county.
McMichael, Josiah K.,	Chicora,	Butler county.
McMillan, John K.,	Washington,	Washington county.
McMullin, Andrew,	2060 E. York street,	Philadelphia.
McMurray, Henry B.,	Burgettstown,	Washington county.
McMurtrie, David,	1106 Eleventh street,	Altoona.
McNabb, Henry S.,	1903 Arch street,	Philadelphia.
McNair, J. Sharon,	Hazleton,	Luzerne county.
McNally, Richard,	633 Thirty-third street,	Pittsburg.
McNaughton, N. W.,	Westfield,	Tioga county.
McNeal, Wm. T.,	Hazleton,	Luzerne county.
McNeil, Robert,	120 W. York street,	Philadelphia.
McNitt, Gilbert F.,	Sheffield,	Warren county.

McNulty, Caleb J.,	22 N. Main street,	Washington.
McVean, Willard,	St. Marys,	Elk county.
McWilliams, Samuel,	West Grove,	Chester.
Meade, Julian F.,	625 S. Sixteenth street,	Philadelphia.
Means, Ralph W.,	267 North avenue,	Allegheny.
Means, Wm. B.,	267 North avenue,	Allegheny.
Means, Wm. B.,	Lebanon,	Lebanon county.
Mebane, D. C.,	Wilkes-Barre,	Luzerne county.
Mebus, Fred. L.,	114 S. Third street,	Easton.
Mebus, J. Walter,	114 S. Third street,	Easton.
Meck, Warren E.,	State Hospital,	Danville.
Medara, Thos. J.,	231 Richmond street,	Philadelphia.
Medd, Henry	2504 Kensington avenue,	Philadelphia.
Megilligan, Chas. H.,	Avondale,	Chester county.
Melhorn, Augustus H.,	Hanover,	Northumberland county.
Melick, Ralph L.,	Sunbury,	York county.
Melick, Wm. McClure,	Philipsburg,	Centre county.
Mell, Samuel S.,	204 S. Second street,	Harrisburg.
Melvin, Ernest H.,	161 Fifth avenue,	Pittsburg.
Mendenhall, H. C.,	Bloomburg,	Columbia county.
Menger, Edward F.,	Tenth and York streets,	Philadelphia.
Mensch, James G.,	Pennsburg,	Montgomery county.
Mentzer, Harlan J.,	Waynesboro,	Franklin county.
Mentzer, Harvey H.,	15th and Market streets,	Philadelphia.
Mercer, Eugene C.,	Beaver Falls,	Beaver county.
Mercer, James H.,	Bloomsburg	Columbia county.
Meredith, S. C.,	221 and Ellsworth streets,	Philadelphia.
Merrell, Albert F.,	19th and Fairmount ave.,	Philadelphia.
Merrell, Hulbert J.,	1813 Wallace street,	Philadelphia.
Merrifield, Robert,	214 N. Main street,	Scranton.
Mershon, E. N. B.,	Saxenburg,	Butler county.
Mershon, H. L.,	New Kensington,	Westmoreland county.
Metz, Abraham L.,	Fifteenth and Race streets,	Philadelphia.
Metz, Frank M.,	Etna,	Allegheny
Metzger, Geo. F.,	Bethlehem,	Northampton county.
Meyer, Chas.,	Macungie,	Lehigh county.
Meyer, Chas. C.,	341 N. Eighteenth street,	Philadelphia.
Meyer, J. Gross,	Wilkes-Barre,	Luzerne county.
Meyer, Robert H.,	Nanticoke,	Luzerne county.
Meyer, Wm. J.,	East Mauch Chunk,	Carbon county.
Meyers, Kirby C.,	Beaver Falls,	Beaver county.
Meyers, Louis J.,	2201 Hunting Park ave.,	Philadelphia.
Michelotti, Victor,	737 S. Eighth street,	Philadelphia.
Michener Elmer D.,	1830 Mervine street,	Philadelphia.
Michener, Wm.,	Deemston,	Washington county.
Micke, Lewis A.,	Easton,	Northampton county.
Hickley, Ewald G. F.,	2801 Girard avenue,	Philadelphia.
Mierziva, R. R. E.,	4724 Liberty avenue,	Pittsburg.
Mikle, John O.,	Avoca,	Luzerne county.
Miller, Aaron G.,	1844 Christian street,	Philadelphia.
Miller, Adolph W.,	Third & Callowhill sts.,	Philadelphia.
Miller, Albert C.,	Hillsville,	Lawrence county.
Miller, Albert T.,	2923 N. Ninth street,	Philadelphia.
Miller, Andrew O.,	Eau Claire,	Butler county.

Miller, Chas. A.,	Liberty,	Tioga county.
Miller, Daniel L.,	Waynesboro,	Franklin county.
Miller, Eli E.,	Beaver Falls,	Beaver county.
Miller, Frank,	Danville,	Montour county.
Miller, Geo. H.,	McDonald,	Washington county.
Miller, Geo. M.,	Burgettstown,	Washington county.
Miller, Geo. S. R.,	8th ave. and 13th street,	Altoona.
Miller, Gustav J.,	1520 Peach street,	Erie.
Miller, Harper G.,	4939 Germantown avenue,	Philadelphia.
Miller, Jacob A.,	35 S. Second street,	Harrisburg.
Miller, Jacob F.,	Beaver Falls,	Beaver county.
Miller, James A.,	59 N. Queen street,	Lancaster.
Miller, John H.,	Berrysburg,	Dauphin county.
Miller, John H.,	Newville,	Cumberland county.
Miller, John Henry,	238 N. Twelfth street,	Philadelphia.
Miller, John L.,	Montgomery,	Lycoming county.
Miller, John P.,	15 N. Eleventh street,	Philadelphia.
Miller, Joseph C.,	2406 Garnet street,	Philadelphia.
Miller, Milton G.,	Blairsville,	Indiana county.
Miller, Phillip,	Hanover,	York county.
Miller, Samuel G.,	McKeesport,	Allegheny county.
Miller, Samuel R.,	Bath,	Northampton county.
Miller, Solomon M.,	State Hospital,	Norristown county.
Miller, Summerfield J.,	Madera,	Clearfield county.
Miller, Warren D.,	Manheim,	Lancaster county.
Milligan, Deatur,	509 N. Second street,	Philadelphia.
Milliken, Wm. H.,	Second and Spruce streets,	Philadelphia.
Mills, John C.,	Duke Centre,	McKean county.
Hinesinger, Thos. L.,	Beaver,	Beaver county.
Minnick, Geo. Jr.,	86 Monterey,	Allegheny.
Minnick, Luther W.,	1021 Market street,	Philadelphia.
Minnick, W. G.,	86 Monterey,	Allegheny.
Minster, P. M.,	Langhorne,	Bucks county.
Minton, Bradley,	Claysville,	Washington county.
Minton, Henry M.,	1509 Tasker street,	Philadelphia.
Mishler, John H.,	Denver,	Lancaster county.
Mitchell, Albert T.,	124 N. Thirteenth street,	Philadelphia.
Mitchell, Benj. B.,	Troy,	Bradford county.
Mitchell, Henry,	1230 Everett street,	Philadelphia.
Mitchell, Henry F.,	Slippery Rock,	Butler county.
Mitchell, Richard W.,	Cape May,	New Jersey.
Mitchell, Robert H.,	884 N. Taylor street,	Philadelphia.
Mitchell, W. H.,	Driftwood,	Cameron county.
Mitchell, Wm. S.,	Susquehanna,	Susquehanna county.
Mitcheltree, J. C.,	Edinburg,	Lawrence county.
Mitcheltree, Wilson,	Edinburg,	Lawrence county.
Mix, Wesley H.,	Sugar Grove,	Warren county.
Mix, Wilbur F.,	Sugar Grove,	Warren county.
Moeller, C. A. F.,	53 N. Twelfth street,	Harrisburg.
Moerk, Frank X.,	2510 Brown street,	Philadelphia.
Moffett, James, Jr.,	529 W. Venango street,	Philadelphia.
Moffett, John, Jr.,	1614 N. Second street,	Philadelphia.
Moffett, Wm.,	1614 N. Second street,	Philadelphia.
Mohn, Chas. L.,	Jersey Shore,	Lycoming county.

Mohn, Geo. C.,	Laurelton,	Union county.
Mohn, John E.,	Jersey Shore,	Lycoming county.
Molster, Chas. W.,	Duke Centre,	McKean county.
Moll, Horace,	3555 N. Broad street,	Philadelphia.
Moller, John D.,	17th and Passyunk ave.,	Philadelphia.
Monie, Thos.,	Archbald,	Lackawanna county.
Monks, Fred'k C.,	Kittanning,	Armstrong county.
Monow, J. Wilson,	Marchand,	Indiana county.
Montelius, R. W.,	Mt. Carmel,	Northumberland county.
Montgomery, A. L. R.,	Mercer,	Mercer county.
Montgomery, Chas. L.,	Mercer,	Mercer county.
Montgomery, E. J.,	206 S. Main street,	Pittsburg.
Montgomery, Wm. H.,	Glen Richey,	Clearfield county.
Montgomery, Wm. R.,	Mercer,	Mercer county.
Moody, Chas. W.,	28th and Columbia avenue,	Philadelphia.
Moody, Wm. E.,	Tremont,	Schuylkill county.
Mook, Allison,	Saegertown,	Crawford county.
Moore, Christian,	Bryn Mawr,	Montgomery county.
Moore, Edward, Jr.,	732 S. Nineteenth street,	Philadelphia.
Moore, H. J.,	Oval,	Lycoming county.
Moore, Howard A.,	Howard,	Centre county.
Moore, Isaac H.,	293 S. Main street,	Wilkes-Barre.
Moore, James C.,	Connellsville,	Fayette county.
Moore, James J.,	1900 Oxford street,	Philadelphia.
Moore, James P.,	Rochester,	Beaver county.
Moore, Joachin B.,	13th and Lombard streets,	Philadelphia.
Moore, Wm. D.,	Juniataville,	Fayette county.
Moore, Wm. J.,	Homer City,	Indiana county.
Moorehead, Frank B.,	Volant,	Armstrong county.
Moorehouse, Wm. G.,	912 N. Sixth street,	Harrisburg.
Moreland, Andrew O.,	Jamestown,	Mercer county.
Moreland, James A.,	Jamestown,	Mercer county.
Morrell, Chas. M.,	5149 Master street,	Philadelphia.
Morcy, John S., Jr.,	Royersford,	Montgomery county.
Morgan, Aston H.,	Market and Meade,	Wilkes-Barre.
Morgan, Benj. G.,	101 N. Main avenue,	Scranton.
Morgan, Edward A.,	369 E. Market street,	Wilkes-Barre.
Morgan, Emily C.,	101 N. Main avenue,	Scranton.
Morgan, Frank E.,	1629 Walnut street,	Philadelphia.
Marrett, Wm. H.,	Holmesburg,	Philadelphia.
Morris, Chas. H.,	Millheim,	Centre county.
Morris, Clinton S.,	Garland,	Warren county.
Morris, Frank D.,	Montrose,	Susquehanna county.
Morris, Frank R.,	Monaca,	Beaver county.
Morris, Joseph G.,	Broad and Bishop streets,	Philadelphia.
Morris, Max,	1336 Green street,	Philadelphia.
Morris, Thos. R.,	686 Preble avenue,	Allegheny.
Morris, Wm. H.,	22d and Market streets,	Philadelphia.
Morris, Wm. J.,	McClure & Wood Run ayes,	Allegheny.
Morrison, Bower E.,	Newton Hamilton,	Mifflin county.
Morrison, James,	Roxborough,	Philadelphia.
Morrison, James D.,	Mercer,	Mercer county.
Morrison, Robert,	Oak Dale Station,	Allegheny county.
Morrison, Wm. M.,	Roxborough,	Philadelphia.

Morriss, Lemuel G.,	Second and Green streets,	Philadelphia.
Morse, Frank,	22d and Christian streets,	Philadelphia.
Morse, H. B.,	17th and South streets,	Philadelphia.
Morse, John E. G.,	212 Sixth street,	Pittsburg.
Morton, Alex R.,	Morton,	Delaware county.
Morton, Robert W.,	Wampum,	Lawrence county.
Morton, Wm. J.,	514 N. Seventh street,	Allentown.
Mosbaugh, L. P. H.,	85 James street,	Allegheny,
Mosebach, F. A.,	822 W Lehigh street,	Philadelphia.
Moser, Altha L.,	Uniontown,	Fayette county.
Moser, Ira D.,	Fifth and Carpenter sts.,	Philadelphia.
Mossbrugger, Otto,	1231 Arch street,	Philadelphia.
Mountain, Walter S.,	Confluence,	Somerset county
Mowers, Joseph H.,	Shippensburg,	Cumberland county.
Moyer, Edwin O.,	Bradford,	McKean county.
Moyer, Elmer E.,	Bloomsburg,	Columbia county.
Moyer, John L.,	Bloomsburg,	Columbia county.
Moyer, Lucas N.,	Bloomsburg,	Columbia county.
Moyer, Reuben E.,	320 N. Ninth street,	Reading.
Moyer, Wm. H.,	Dalmatia,	Northumberland county.
Moyer, Wm. P.,	Freeburg,	Snyder county.
Moyer, Wm. S.,	Bloomsburg,	Columbia county.
Moylan, Cornelius,	23d and Wharton streets,	Philadelphia.
Mueller, Henry,	4434 Lancaster avenue,	Philadelphia
Muhlenberg, H. M.,	Reading,	Berks county.
Muir, Clarence F.,	2500 Meredith street,	Philadelphia.
Mull, Harry,	Stewartstown,	York county
Mullhaupt, Alfred,	St. Marys,	Elk county.
Mullen, James B.,	Warren,	Warren county.
Mullen, James J.,	6004 Penn avenue,	Pittsburg.
Mullen, Benj. F.,	Fayette City,	Fayette county.
Mullock, Corwin,	1015 Columbia avenue,	Philadelphia.
Mumma, Frank G.,	Mechanicsburg,	Cumberland county.
Munsch, Jennie S.,	Bellevue,	Allegheny county.
Munshower, John,	Hillsdale,	Indiana county
Murdock, Alex, J.,	Washington,	Washington county.
Murdock, Geo. C.,	Wampum,	Lawrence county.
Murjahn, Louis,	501 S. Seventh street,	Philadelphia
Murphy, E. O.,	West Newton,	Westmoreland county.
Murphy, John F.,	2 Carson street,	Pittsburg.
Murphy, Thos. P.,	Towanda,	Bradford county.
Murphy, Thos. W.,	East Brady,	Clarion county.
Murray, Bernard J.,	6622 Germantown avenue,	Philadelphia.
Murray, Edward R.,	24 E. Mt. Airy avenue,	Germantown.
Murray, Harry L.,	900 Eighth avenue,	Altoona.
Murray, J. A.,	Mehaffey,	Clearfield county.
Murray, Jared D.,	Centre Hall,	Centre county.
Murray, John R.,	Kittanning,	Armstrong county.
Murray, Wm. R.,	Milton,	Northumberland county.
Murto, Harry C.,	2907 Carson street,	Pittsburg.
Musgrave, Aaron W.,	101 S. Main avenue,	Scranton.
Musselman, D. G. E.,	20th and Parrish streets,	Philadelphia.
Musselman, David Z.,	Braddock,	Allegheny county.
Musselman, John,	4000 Chestnut street,	Philadelphia.



Musselman, Morris M.,	Chester,	Delaware county.
Musser, Frank M.,	Lewistown,	Mifflin county.
Mussina, Chas. C.,	1400 Fourteenth street,	Washington, D. C.
Musson, Wm A.,	1500 S. Broad street,	Philadelphia.
Mutchler, Henry M.,	Eas Stroudsburg,	Monroe county.
Muthersbough, J. A.,	Lewistown,	Mifflin county.
Myers, A. A.,	1317 Green street,	Philadelphia.
Myers, A. Harold,	Scottsdale,	Westmoreland county.
Myers, Chas. L.,	York Springs,	Adams county.
Myers, Franklin,	Mahanoy City,	Schuylkill county.
Myers, Henry J.,	514 South 24th St.,	Philadelphia.
Myers, John F.,	Scranton,	Lackawanna county.
Myers, Josiah J.,	Nescopeck,	Luzerne county.
Myers, Samuel J.,	Emlenton,	Venango county.
Myers, Sarah S.,	Emlenton,	Venango county.
Myers, Wilbur,	Edinsburg,	Marion county.
Myers, Wm. H.,	807 North Eleventh street,	Philadelphia.
Myers, Wm. T.,	4th and Susquehanna ave.,	Philadelphia.
Nace, W. B.,	Halifax,	Dauphin county.
Nason, Wm.,	Townville,	Crawford county.
Nagle, Clayton M.,	18th and Jefferson streets,	Philadelphia.
Nail, Lorenzo G.,	210 State street,	Sharon.
Naugle, Fred'k S.,	742 Christian street,	Philadelphia.
Naylor, K. Elizabeth,	755 South Tenth street,	Philadelphia.
Neamand, Harry,	Quakertown,	Bucks county.
Nebecker, Aquila,	1201 Ellsworth street,	Philadelphia.
Nebig, Wm. G.,	18th and Susquehanna av.,	Philadelphia.
Neef, Jacob W.,	1015 Columbia avenue,	Philadelphia.
Neely, Alexander E.,	West View,	Allegheny county.
Neely, Charles G.,	12th and Chestnut streets,	Philadelphia.
Neely, John F.,	Renovo,	Clinton county.
Neely, Joseph A.,	Bennett,	Allegheny.
Neely, Joseph F.,	400 Rebecca street,	Allegheny.
Neely, William O.,	501 Second avenue,	Pittsburg.
Neff, George W.,	305 South George street,	York.
Neff, Harry G.,	Dawson,	Payette county.
Neill, Alfred D.	Marionville,	Forest county.
Nelson, William H.,	424 Fairmount avenue,	Philadelphia.
Nelson, William W.,	Jenkintown,	Montgomery county.
Nemon, Luther M.,	Sewickley,	Allegheny county.
Neuber, George G. F.,	2808 Girard avenue,	Philadelphia.
Newbaker, John B.,	Trevorton,	Northumberland county.
Newbold, Thomas M.,	4060 Chestnut street,	Philadelphia.
Newcomb, George G. E.,	5 Halsey Place,	Allegheny.
Newhard, Emily B.,	Fernwood,	Delaware county.
Newhard, Robert M.,	Fernwood,	Delaware county.
Newhart, Silas H.,	Scranton,	Lackawanna county.
Newlon, Benson C.,	Sharpsburg,	Allegheny.
Newman, G. Ernest,	Canton,	Bradford county.
Newsham, Stanley P.,	1640 South Fifth street,	Philadelphia.
Newton, Alexander B.,	Manheim and Wayne sts.,	Germantown.
Newton, Charles R.,	Montrose,	Susquehanna county.
Newton, John A.,	West Elizabeth,	Allegheny county.
Newton, Robley D.,	1735 Vine street,	Philadelphia.

Ney, John L., ..... Shartlesville, ..... Berks county.  
 Nice, Harry J., ..... Lock Haven, ..... Clinton county.  
 Nicholas, John B., ..... 621 Race street, ..... Harrisburg.  
 Nichols, George T., ..... Oil City, ..... Venango county.  
 Nick, Charles W., ..... 2404 Peach street, ..... Erie.  
 Nick, Frederick, ..... 1102 State street, ..... Erie.  
 Nickum, Elwood G., ..... Bethlehem, ..... Northampton county.  
 Nickum, James W., ..... 138 North Twelfth street, .. Philadelphia.  
 Nicourd, Henry E., Jr., ... Fifth and Pine streets, ... Philadelphia.  
 Nisbet, William W., ..... Washington & Allen avs. Pittsburg.  
 Niskey, Peter, ..... 1939 Girard avenue, ..... Philadelphia.  
 Noaker, Harry O., ..... Milton, ..... Northumberland county.  
 Nolte, Henry A., ..... 162 North Eighth street, .. Philadelphia.  
 Non, Edward J., ..... 944 North Second street, .. Philadelphia.  
 Norman, Thomas, Jr., ... Hites, ..... Allegheny county.  
 Norton, Albert E., ..... Ashbourne, .....  
 Nourse, Charles F., ..... Centre ave. and Erin st., Pittsburg.  
 Nowlin, Samuel F., ..... Greensburg, ..... Westmoreland county.  
 Nunemacher, A. W., ..... Third and North streets, .. Harrisburg.  
 Nye, Hiram, ..... Enon Valley, ..... Lawrence county.  
 Oberholtzer, Charles H., .. Phoenixville, ..... Chester county.  
 Obley, Henry A., ..... West Newton, ..... Westmoreland county.  
 Ochse, George H., ..... 2300 Oxford street, ..... Philadelphia.  
 O'Donnell, David H., ..... 868 Market street, ..... York.  
 O'Donnell, George H., ... Scranton, ..... Lackawanna county.  
 O'Donnell, Timothy F., ... Parsons, ..... Luzerne county.  
 Oellig, Harry W., ..... Woodbury, ..... Bedford county.  
 Oerter, Albert E., ..... 2050 Vine street, ..... Philadelphia.  
 Oetinger, Albert, ..... 967 North Fifth street, ... Philadelphia.  
 Obilby, William, ..... 1801 Chestnut street, ..... Philadelphia.  
 Ogle, Joseph N., ..... Midway, .....  
 Ohall, Irvin E., ..... 140 North Tenth street, . Philadelphia.  
 O'Keefe, S. C., ..... 428 Penn avenue, ..... Pittsburg.  
 O'Keefe, W. F. H., ..... 428 Penn avenue, ..... Pittsburg.  
 Olinhart, Louis, ..... 900 Callowhill street, ..... Philadelphia.  
 Orth, Frederick C., ..... Holmesburg, ..... Philadelphia.  
 Osborne, Albert E., ..... Wallingford, ..... Delaware county.  
 Osborne, Melmoth M., ... 908 Spruce street, ..... Philadelphia.  
 Osman, Joseph R., ..... 803 Radcliffe street, ..... Bristol.  
 Ott, Charles W., ..... 8th and Huntingdon sts., Philadelphia.  
 Ott, Emile, ..... Fifth and Pine streets, ... Philadelphia.  
 Ott, George A., ..... Bangor, ..... Northampton county.  
 Ott, Peter G., ..... Bangor, ..... Northampton county.  
 Ottinger, Franklin, ..... Parker City, ..... Armstrong county.  
 Ottinger, James J., ..... Twentieth and Spruce sts., Philadelphia.  
 Ouram, Charles, ..... 668 North Fifteenth street, Philadelphia.  
 Ousey, Samuel B., ..... Clifton Heights, ..... Delaware county.  
 Outman, W. H., ..... Westfield, ..... Tioga county.  
 Outwater, Harry E., ..... Susquehanna, ..... Susquehanna county.  
 Over, Byron, ..... 14 Berlin street, ..... Pittsburg.  
 Over, David A., ..... 1320 Columbia avenue, ... Philadelphia.  
 Over, Edwin W., ..... Apollo, .....  
 Owen, Harry P., ..... Toughkenamon, ..... Chester county.

Owens, William P., ..... 920 North Forty-first st., Philadelphia.  
 Owsley, John C., ..... Sharon, ..... Mercer county.  
 Pachali, Theodore, Jr., ... 239 South Eleventh street, Philadelphia.  
 Paff, Lawrence, ..... Beaver Falls, ..... Beaver county.  
 Paff, William, .. ..... Beaver Falls, ..... Beaver county.  
 Page, Edward L., ..... 1400 Spruce street, ..... Philadelphia.  
 Painter, Albra W., ..... Muncy, ..... Lycoming county.  
 Painter, Thomas, ..... Muncy, ..... Lycoming county.  
 Paisley, Winfield S., ..... New Castle, ..... Lawrence county.  
 Palmer, Charles W., ..... New Hope, ..... Bucks county.  
 Palmer, Merritt T., ..... Bart, ..... Lancaster county.  
 Paris, Edgar P., ..... Sixth and Germantown av. Philadelphia.  
 Park, Leon N., ..... Marion Centre, ..... Indiana county.  
 Park, Robert A., ..... Ridgway, ..... Elk county.  
 Parke, Charles R., ..... 306 Washington avenue, .. Scranton.  
 Parker, A. H., ..... Braddock, ..... Allegheny county.  
 Parker, John J., ..... Norris and Memphis sts., Philadelphia.  
 Parks, J. H., ..... Leechburg, ..... Armstrong county.  
 Parratt, Eugene X., ..... 229 Jacoby street, ..... Philadelphia.  
 Parrish, C. M., ..... Bellefonte, ..... Centre county.  
 Parse, Merritt, ..... 4033 Powelton avenue, ... Philadelphia.  
 Parsons, A. W., ..... 713 Callowhill street, ..... Philadelphia.  
 Parsons, George L., ..... 2407 Fairmount avenue, .. Philadelphia.  
 Parsons, William H., ..... 52 Lillian street, ..... Pittsburg.  
 Partree, Charles, ..... 237 Wyoming avenue, .... Scranton.  
 Patrick, Elmer A., ..... 918 Main street, ..... Sharpsburg.  
 Patten, Edwin W., ..... Waterford, ..... Erie county.  
 Patterson, James I., ..... Knox, ..... Clarion county.  
 Patterson, James L., ..... 21st st. and Ridge ave., .. Philadelphia.  
 Patterson, John A., ..... Washington, ..... Washington county.  
 Patterson, William B., ... 820 South Fifth street, .... Reading.  
 Patterson, William F. R., ... 921 Wood street, ..... Wilkinsburg.  
 Patton, David B., ..... Fayette city, ..... Fayette county.  
 Patton, John F., ..... York, ..... York county.  
 Patton, John P., ..... 127 South Fourth street, .. Philadelphia.  
 Paules, John L., ..... 4th av. and Smithfield st., Pittsburg.  
 Paulin, George L., ... 2407 Fairmount avenue, .. Philadelphia.  
 Pauly, John A., ..... Transfer, ..... Mercer county.  
 Pauly, M. E., .... Transfer, ..... Mercer county.  
 Pauly, William Franklin, ... 4067 Penn avenue, ..... Pittsburg.  
 Paxson, Elmer M., ..... 460 East Thompson street, Philadelphia.  
 Peabody, William L., ... 1336 Green street, ..... Philadelphia.  
 Pealer, Charles E., ..... Dushore, ..... Sullivan county.  
 Pearce, James A., ..... Livermore, ..... Westmoreland county.  
 Pashin, Edward V., ..... 412 South Thirteenth st., .. Philadelphia.  
 Pechin, William J., ..... 20th st. and Columbia av., Philadelphia.  
 Pechmann, William, ..... Linwood, ..... Delaware county.  
 Peck, Aulay W., ..... 906 South Forty-ninth st., Philadelphia.  
 Peck, George W., ..... Grand Valley, ..... Warren county.  
 Peck, Jesse L., ..... Wyoming & Luzerne avs., West Pittston.  
 Pelssahkovitch, M., ..... 724 South Fourth street, .. Philadelphia.  
 Pellett, Gurdon E., ..... 4000 Chestnut street, ..... Philadelphia.  
 Peltz, G. M. D., ..... 716 North Fifteenth street, Philadelphia.  
 Pendell, Frank E., ..... Sheridanville, .....

Pennepacker, P. W.,	..... Towanda,	..... Bradford county.
Pennock, Edward,	..... Oxford,	..... Chester county.
Pennypacker, Nathan,	.... 5th and Callowhill sts.,	.. Philadelphia.
Pentz, Frank A.,	..... Punsutawney,	..... Jefferson county.
Perlman, Bernhard,	..... 633 Catharine street,	..... Philadelphia.
Perrenot, Emile A.,	..... 4834 Lancaster avenue,	.. Philadelphia.
Perrin, Elizabeth H.,	.... Carnegie,	..... Allegheny county.
Perrin, James M.,	..... Carnegie,	..... Allegheny county.
Perse, William P.,	..... Plymouth,	..... Luzerne county.
Pershing, Frank R.,	..... Pottsville,	..... Schuylkill county.
Peters, David A.,	..... Steelton,	..... Dauphin county.
Peters, Henry E.,	..... 639 Hamilton street,	..... Allentown.
Peters, R. C.,	..... 813 Hamilton street,	..... Allentown.
Petty-John, William Q.,	.. 1316 Green street,	..... Philadelphia.
Petty, William,	..... 104 Hanover street,	..... Wilkes-Barre.
Petzelt, Christopher,	..... 800 McKean street,	..... Philadelphia.
Pfouts, William C.,	..... Second and State streets,	Harrisburg.
Pfromm, Adam,	..... 233 North Second street,	.. Philadelphia.
Phelps, Dudley G.,	..... Smithfield,	..... Bradford county.
Phelps, John H.,	..... Wyoming av. & Spruce st.,	Scranton.
Phillips, Asa L.,	..... Warren,	..... Warren county.
Phillips, Hugh,	..... Glenfield,	..... Allegheny county.
Phillips, Joseph W.,	..... Danville,	..... Montour county.
Phillips, L. B.,	..... 1041 South Third street,	.. Philadelphia.
Phillips, Oscar W.,	..... 928 South Ninth street,	.. Philadelphia.
Richel, Gustav,	..... 418 Lackawanna avenue,	Scranton.
Pickett, Charles T.,	..... 920 Callowhill street,	..... Philadelphia.
Pier, Walter B.,	..... Duryea,	..... Luzerne county.
Pierce, Herman J.,	..... 1603 Summer street,	..... Philadelphia.
Pierce, William A.,	..... 23 North High street,	..... West Chester.
Pile, Gustavus,	..... 770 Passyunk avenue,	..... Philadelphia.
Pinchback, P. N.,	..... 3359 Woodland avenue,	.. Philadelphia.
Pinter, Edmund,	..... 1800 North Fifteenth st.,	.. Philadelphia.
Piper, Austin C.,	..... Coal Centre,	..... Washington county.
Piper, Cary,	..... Coal Centre,	..... Washington county.
Plank, Jacob R.,	..... York Springs,	..... Adams county.
Platt, Edwin M.,	..... 121 South Thirty-sixth st.,	Philadelphia.
Platt, George F., Jr.,	..... 121 South Thirty-sixth st.,	Philadelphia.
Pleibel, Adolph W.,	..... 2480 Frankford Road,	.. Philadelphia.
Pleibel C. F. W.,	..... 2480 Frankford Road,	.. Philadelphia.
Pleibel, Eugene T.,	..... 2480 Frankford Road,	.. Philadelphia.
Plotner, William S.,	..... Mt. Pleasant,	..... Westmoreland county.
Plough, William H.,	..... Smithfield & Liberty sts.,	Pittsburg.
Podolski, L. A.,	..... Sixth and Poplar streets,	.. Philadelphia.
Poley, Warren H.,	..... 6519 Germantown avenue,	Philadelphia.
Pollard, Augustus T.,	..... 239 South Eleventh street,	Philadelphia.
Pollock, Robert B., Jr.,	..... 1120 Jackson street,	..... Philadelphia.
Pomeroy, F. B.,	..... Dushore,	..... Sullivan county.
Pooler, George W.,	..... Greensburg,	..... Westmoreland county.
Porr, John L.,	..... 147 North Front street,	.. Steelton.
Porter, Calvin,	..... Alexandria,	..... Huntingdon county.
Porter, Clark B.,	..... Towanda,	..... Bradford county.
Porter, Clifford C.,	..... Greensburg,	..... Westmoreland county.

Porter, Henry C., ..... Towanda, ..... Bradford county.  
 Porter, J. Elmer, ..... Pottstown, ..... Montgomery county.  
 Porter, John Morris, ..... 2242 Turner street, ..... Philadelphia.  
 Porter, M. Arthur, ..... Canton, ..... Bradford county.  
 Porter, Mary M. E., ..... Phoenixville, ..... Chester county.  
 Porter, Moses E., ..... Dawson, ..... Fayette county.  
 Porter, Robert M., ..... Williamsport, ..... Lycoming county.  
 Porter, Samuel E., ..... Vanderbilt, ..... Fayette county.  
 Porter, Samuel H., ..... High & Washington sts., ..... Pottstown.  
 Porter, William Edgar, ... 131 North Eleventh street, Philadelphia.  
 Porter, William T., ..... Phoenixville, ..... Chester county.  
 Portser, Charles H., ..... 823 North Broad street, ... Philadelphia.  
 Post, Francis Elmer, ..... 646 North Twelfth street, Philadelphia.  
 Poth, Adolph H., ..... Twelfth and Carson sts., Pittsburgh.  
 Pottelger, William F., ... Fourth and Spruce streets, Reading.  
 Potter, John D., ..... 81 Arlington avenue, ..... Pittsburg.  
 Potter, Robert J., ..... 81 Arlington avenue, ..... Pittsburg.  
 Potts, David G., ..... 24 South Second street, .. Philadelphia.  
 Potts, George C., ..... 1624 North Fifth street, .. Harrisburg.  
 Potts, Thomas H., ..... 24 South Second street, .. Philadelphia.  
 Potts, William J., ..... Ligonier, ..... Westmoreland county.  
 Povinsky, Charles, ..... 710 South Second street, .. Philadelphia.  
 Powell, Thomas P., ..... Meadville, ..... Crawford county.  
 Powell, William H., ..... Columbia, ..... Lancaster county.  
 Power, Edward S., ..... 15th st. & Montgomery av., Philadelphia.  
 Preston, David, ..... Ninth and Lombard sts., Philadelphia.  
 Preuss, John, ..... 1634 North Fourth street, Philadelphia.  
 Price, Elmer E., ..... Waterford, ..... Erie county.  
 Price, Thomas A., ..... Bridesburg, ..... Philadelphia.  
 Price, William C., ..... Pittston, ..... Luzerne county.  
 Prichard, James, ..... Tyrone, ..... Blair county.  
 Prickitt, Frank W., ..... Rosemont, ..... Montgomery county.  
 Prideaux, Thomas A., ... Smith Falls, ..... Clearfield county.  
 Prieson, Adolph, ..... Main and Vesper streets, Lock Haven.  
 Pringle, Allison A., ..... South Fork, ..... Cambria.  
 Pritchard, Benjamin E., .. McKeesport ..... Allegheny county.  
 Proctor, Wallace, ..... 1900 Pine street, ..... Philadelphia county.  
 Proper, Walter J., ..... Pleasantville, ..... Venango county.  
 Prout, Jacob S., ..... Wiconisco, ..... Dauphin county.  
 Prowell, William R., ..... Steelton, ..... Dauphin county.  
 Pryor, Frank C., ..... Morrisville, ..... Bucks county.  
 Pryor, William B. T., ... Langhorne, ..... Bucks county.  
 Pulsifer, James P., ..... 800 Walnut street, ..... Philadelphia.  
 Purdon, Thomas A., ..... Dalton, ..... Lackawanna county.  
 Purdon, W. N., ..... Tunkhannock, ..... Wyoming county.  
 Purdue, Frank T., ..... 1829 South Second street, Philadelphia.  
 Purnell, Howard, ..... Ansonville, ..... Clearfield county.  
 Pursell, Howard, ..... Bristol, ..... Bucks county.  
 Pursell, Stacy B., ..... Bristol, ..... Bucks county.  
 Yyfer, Howard F., ..... Jefferson Medical College, Philadelphia.  
 Pyle, Phillip A., ..... Mt. Joy, ..... Lancaster county.  
 Pyle, Robert L., ..... London Grove, ..... Chester county.  
 Quail, Charles E., ..... Auburn, ..... Schuylkill county.

Quaintance, Rebecca D.,	Churchtown,	Lancaster county.
Quigley, T. V. S.,	Littlestown,	Adams county.
Quine, John H.,	1238 South Broad street,	Philadelphia.
Quinn, John A.,	Lansford,	Carbon county.
Quinn, Lemuel A.,	DuBois,	Clearfield county.
Quinn, Wallace C.,	Crenshaw,	Jefferson county.
Rabenon, Arwed G.,	Fifth and Spruce streets,	Philadelphia.
Rabenan, Herman,	112 North Centre street,	Pottsville.
Radeffeld, Frederick,	Fourth and Lombard sts.,	Philadelphia.
Raker, Fred. D.,	126 E. Independence st.,	Shamokin.
Ralston, George F.,	2652 Ann street,	Philadelphia.
Ralston, John C.,	Wilkinsburg,	Allegheny county.
Ramsey, Charles C.,	Market and Parrish sts.,	Philadelphia.
Ramsey, James H.,	West Bridgewater,	Beaver county.
Randal, Harry L.,	1122 Wyamensing avenue,	Philadelphia.
Raney, Willis,	New Castle,	Lawrence county.
Rankin, Edgar A.,	Linesville,	Crawford county.
Rankin, George T.,	Linesville,	Crawford county.
Rankin, Harvey,	Elderton,	Armstrong county.
Rankin, James L.,	5100 Penn avenue,	Pittsburg.
Rankin, James R.,	Muncy,	Lycoming county.
Rankin, Lillie B.,	1744 Park avenue,	Philadelphia.
Ranking Michael M.,	Brockwayville,	Jefferson county.
Ranney, Cassius M.,	New Castle,	Lawrence county.
Ranney, Robert B.,	New Castle,	Lawrence county.
Rapp, Frederick,	2101 Locust street,	Philadelphia.
Raser, George P.,	429 Arch street,	Philadelphia.
Raser, John B.,	154 North Sixth street,	Reading.
Rathmell, George M.,	Cadwallader,	Fayette.
Rau, Eugene A.,	Bethlehem,	Northampton county.
Rau, Robert,	Bethlehem,	Northampton county.
Raudenbush, Charles H.,	801 Penn street,	Reading.
Raymer, William,	Beaver Falls,	Beaver county.
Rayner, Howard L.,	3317 N. Twenty-second st.,	Philadelphia.
Rea, James L.,	1560 Dickson avenue,	Scranton.
Rea, John,	Doylestown,	Bucks county.
Read, Charles C.,	Huntington,	Huntingdon.
Read, Frederick B.,	Osceola Mills,	Clearfield county.
Read, Harry W.,	Huntingdon,	Huntingdon.
Read, Ralph M.,	Osceola Mills,	Clearfield county.
Read, Thomas,	Huntingdon,	Huntingdon.
Reading, Albert J.,	Hatboro,	Montgomery county.
Reading, Emry L.,	1201 South Second street,	Philadelphia.
Reading, Joel S.,	3952 Lancaster avenue,	Philadelphia.
Reading, William V. D.,	Norristown,	Montgomery county.
Reagan, M. F.,	Broad Ford,	Fayette county.
Reagan, Robert S.,	Broad Ford,	Fayette county.
Reavley, George D.,	918 Parade street,	Erie.
Rectenwald, Louis A.,	89 Washington avenue,	Pittsburg.
Redeker, F. William,	Espy,	Columbia county.
Redick, John C.,	Butler,	Butler county.
Redington, Robert F.,	Troy,	Bradford county.
Redner, T. R.,	554 North Tenth street,	Philadelphia.

Redsecker, Jacob H.,	Lebanon,	Lebanon county.
Reed, Andrew B.,	Plymouth,	Luzerne county.
Reed, Charles E.,	Zellenople,	Butler county.
Reed, Frederick M.,	Thurlow,	Delaware county.
Reed, James M. P.,	431 Market street,	Pittsburg.
Reed, Kenneth A.,	Gallitzin,	Cambria county.
Reed, Raymond E.,	1306 North Third street,	Harrisburg.
Reed, R. D.,	Honesdale,	Wayne county.
Reed, Willoughby H.,	Norristown,	Montgomery county.
Reed, William H.,	Camden,	Allegheny county.
Reeder, Milton T.,	Millersville,	Lancaster county.
Reemsnyder, H. G.,	Ephrata,	Lancaster county.
Reese, David J.,	17th and Huntingdon sts.,	Philadelphia.
Reese, John W.,	Taylor,	Lackawanna county.
Reese, Lewis,	1913 Lombard street,	Philadelphia.
Reeser, William Howard,	14th and Cotton streets,	Reading.
Reeve, James W.,	1755 North Thirteenth st.,	Philadelphia.
Regar, David S.,	2137 Master street,	Philadelphia.
Regar, Wayne S.,	8th and Walnut streets,	Philadelphia.
Rehbein, Louis W.,	221 N. Twenty-second st.,	Philadelphia.
Reich, Solomon M.,	1911 Fifth avenue,	Pittsburg.
Reichard, Alonzo A.,	Sharpsville,	Mercer county.
Reichenbacher, Fred. C.,	Honesdale,	Wayne county.
Reichert, Hannah A.,	Kittanning,	Armstrong county.
Reichert, Henry B.,	Kittanning,	Armstrong county.
Reichert, John E.,	Kittanning,	Armstrong county.
Reld, John C.,	Clarion,	Clarion county.
Reider, Edwin S.,	Renovo,	Clinton county.
Reidenbach, Elmer A.,	Thirty-fourth & Pine sts.,	Philadelphia.
Relf, Ernest,	1632 North Third street,	Philadelphia.
Reiher, John,	3343 Penn avenue,	Pittsburg.
Reimann, Louis P.,	Fifth and Poplar streets,	Philadelphia.
Reimensnyder, M. V.,	24 North Fourth street,	Sunbury.
Reisert, William,	1717 South Eighth street,	Philadelphia.
Reizenstein, Albert G.,	Lebanon,	Lebanon county.
Remig, John H.,	1201 Christian street,	Philadelphia.
Remington, J. P.,	1832 Pine street,	Philadelphia.
Renn, Phillip H.,	99 Market street,	Sunbury.
Rennecker, C. E.,	Sharon,	Mercer county.
Renniman, William J.,	Avoca,	Luzerne county.
Reno, William N.,	Spartansburg,	Crawford county.
Renting, Theodore Wm.,	Titusville,	Crawford county.
Rentschler, Charles, Jr.,	400 Penn street,	Reading.
Rentzel, Elmer E.,	Cresson and Gay streets,	Manayunk.
Resser, Thomas C.,	Waynesboro,	Franklin county.
Reuss, William,	833 South Second street,	Philadelphia.
Rewalt, John W.,	Middle own,	Dauphin county.
Rex, Joseph,	943 Pennsylvania avenue,	Philadelphia.
Reynolds, Avery W.,	Carbondale,	Lackawanna county.
Reynolds, John B.,	200 North Front street,	Philadelphia.
Reynolds, J. M. C.,	Glyde,	Washington.
Reynolds, May,	1534 Dauphin street,	Philadelphia.
Reynolds, Samuel,	Reynoldsville,	Jefferson county.

Reynolds, William D.,	Delano,	Schuylkill county.
Rhoades, Edward E.,	Mt. Carmel,	Northumberland county.
Rhoades, Stephen H.,	Pittston,	Luzerne county.
Rhoades, William S.,	Huotzdale,	Clearfield county.
Rhodes, Charles R.,	Hyndman,	Bedford county.
Rhodes, E. M.,	Mt. Union,	Huntingdon county.
Rhodes, W. R.,	Columbus,	Warren county.
Rice, Frederick W.,	Rome,	Bradford county.
Rice, George L.,	McSherrystown,	Adams county.
Rice, Willard M., Jr.,	6102 Germantown avenue,	Philadelphia.
Rice, William,	353 Beaver avenue,	Allegheny.
Rice, William,	Rome,	Bradford county.
Richards, Alfred N.,	401 Northampton street,	Easton.
Richard, Charles,	North East,	Erie county.
Richards, Davis B.,	1726 North Eighteenth st.,	Philadelphia.
Richards, George W.,	Duquesne,	Allegheny county.
Richards, Miles,	McKeesport,	Allegheny county.
Richardson, Alick G.,	1029 Liberty street,	Pittsburg.
Richardson, Harry,	Girardville,	Erie county.
Richardson, James H.,	Twentieth and South sts.,	Philadelphia.
Richardson, Neafie,	Fourth and Berks sts.,	Philadelphia.
Richardt, Frank E.,	New Albany,	Bradford county.
Riche, Walter A.,	Ashland,	Schuylkill county.
Richey, Elisha C.,	Latrobe,	Westmoreland county.
Richman, Edward M.,	2030 Brandywine street,	Philadelphia.
Richter, Gustave A.,	801 South Front street,	Philadelphia.
Rickert, William M.,	2029 North Twentieth st.,	Philadelphia.
Ridgway, Charles A.,	Titusville,	Crawford county.
Ridgway, William F.,	36th and Sansom sts.,	Philadelphia.
Ridpath, John W.,	Jenkintown,	Montgomery county.
Riedenauer, F. P.,	Main and Chelton avenues,	Germantown.
Riegel, Charles H.,	127 Reed street,	Reading.
Riegel, Samuel J.,	Front and Lehigh avenue,	Philadelphia.
Riesenman, John,	Franklin,	Venango county.
Riesenman, Joseph,	Franklin,	Venango county.
Riggs, Leander,	Elizabeth,	Allegheny county.
Riley, Charles T.,	Pulaski,	Lawrence county.
Ringler, George P.,	Bloomsburg,	Columbia county.
Rinker, William H.,	2108 North Eighth street,	Philadelphia.
Riott, Lawrence F.,	172 Ohio street,	Allegheny.
Rishell, John D.,	1114 Sansom street,	Philadelphia.
Risher, John McC.,	Shire Oaks,	Washington county.
Rishton, William S.,	Bloomsburg,	Columbia county.
Rising, John H.,	Du Bois,	Clearfield county.
Risley, John C., Jr.,	2201 E. Thompson street,	Philadelphia.
Ritchey, V. H.,	Carlisle,	Cumberland county.
Rienour, Joseph K.,	Uniontown,	Fayette county.
Ritter, Frederick D.,	Gaines,	Tioga county.
Ritter, F. William,	911 North Franklin street,	Philadelphia.
Ritz, Charles M.,	Lewistown,	Mifflin county.
Ritz, W. W.,	Seventh and Liberty ave.,	Pittsburg.
Roach, William H.,	Driftwood,	Cameron county.
Robert, Victor C.,	1109 S. Forty-seventh st.,	Philadelphia.
Roberts, Alma A.,	Union City,	Erie county.



Roberts, Charles H.,	..... 4343 Frankford avenue,	Philadelphia.
Roberts, Charles H. B.,	.. 1307 North Twenty-four st.,	Philadelphia.
Roberts, Charles J.,	..... Warren Tavern,	Chester county.
Roberts, George W.,	..... Washington,	Washington county.
Roberts, Hugh M.,	..... Jackson,	Susquehanna county.
Roberts, James W.,	..... 5645 Rural avenue,	Pittsburg.
Roberts, John K.,	..... Cochranston,	Crawford county.
Roberts, Joseph C.,	..... Coatesville,	Chester county.
Roberts, J. V. C.,	..... 4128 Market street,	Philadelphia.
Roberts Ray F.,	..... Jackson,	Susquehanna county.
Roberts, W. D.,	..... Washington,	Washington county.
Robertson, A. E.,	..... 101 Wood street,	Pittsburg.
Robertson, Henry E.,	..... 3213 North Seventeenth st.,	Philadelphia.
Robin, Peter,	..... 2401 Penn street,	Pittsburg.
Robins, Edwin S., Jr.,	..... 610 Shamokin street,	Shamokin.
Robins, Howard G.,	..... 158 North Tenth street,	Philadelphia.
Robins, Mrs. Kate E.,	..... 423 Sunbury street,	Shamokin.
Robinson, Bert B.,	..... Oswago,	Potter county.
Robinson, David S.,	..... Dallas and Forbes avenue,	Pittsburg.
Robinson, D. Fred.,	..... Brownsville,	Fayette county.
Robinson, Harry H.,	..... Saltsburg,	Indiana county.
Robinson, Hayden W.,	..... 512 Market street,	Brownsville.
Robinson, Raleigh,	..... Hatboro,	Montgomery county.
Robinson, Robert,	..... East Brady,	Clarion county.
Robinson, William C.,	..... Saltsburg,	Indiana county.
Robinson, William H.,	..... 17 North Centre street,	Pottsville.
Rocap, William A.,	..... Olney, 22d ward,	Philadelphia.
Roche, Edward M., Jr.,	..... 4028 Eaglesfield street,	Philadelphia.
Roche, James H.,	..... Bradford,	McKean county.
Roche, William F.,	..... McVeytown,	Mifflin county.
Rock, Peter J.,	..... 917 North Eighth street,	Philadelphia.
Rockwell, Margaret A.,	..... Emporium,	Cameron county.
Rodgers, John R.,	..... Hogenstown,	Cumberland county.
Rodgers, William H.,	..... Mifflintown,	Juniata county.
Rodman, James T.,	..... Hawley,	Wayne county.
Roe, Edward J.,	..... Derry and Mulberry sts.,	Harrisburg.
Roe, Wm. Grant,	..... Derry and Mulberry sts.,	Harrisburg.
Roebuck, John H.,	..... Bethlehem,	Northampton county.
Roedel, William R.,	..... 441 Cumberland street,	Lebanon.
Roeder, Jonas E.,	..... 2604 Montgomery avenue,	Philadelphia.
Roessner, Frank G.,	..... 1302 Lawrence street,	Philadelphia.
Rogers, Charles A.,	..... Freeport,	Armstrong county.
Rogers, Franklin P.,	..... West Chester	Chester county.
Rogers, John T.,	..... Waynesburg	Greene county.
Rogers, Oswald,	..... Alden Station,	Luzerne county.
Rohn, Peter S.,	..... 23d and Dickinson sts.,	Philadelphia.
Rohrer, George S.,	..... Kittanning,	Armstrong county.
Rohrer, Howard,	..... 336 North Duke street,	Lancaster county.
Rohrer, Thad. M.,	..... Quarryville,	Lancaster.
Roidot, Athanasie,	..... 805 Vine street,	Philadelphia.
Rolff, Julius,	..... Morrisville,	Bucks county.
Romburg, Frederick,	..... 430 North Ninth street,	Philadelphia.
Root, William G.,	..... 236 West Fourth street,	Williamsport.
Rosboro, Frank H.,	..... Dawson,	Fayette county.

Rosenberger, E. S.,	7th and Germantown av.,	Philadelphia.
Rosenberger, William D.,	7th and Germantown av.,	Philadelphia.
Rosenstock, Louis,	3045 Grays' Ferry Road,	Philadelphia.
Ross, David H.,	567 East Norris street,	Philadelphia.
Ross, David W.,	2167 East Cumberland st.,	Philadelphia.
Ross, Eben J.,	Oxford,	Chester county.
Ross, George H.,	Luzerne,	Luzerne county.
Ross, George R.,	Lebanon,	Lebanon county.
Ross, H. Frank,	Russelville,	Chester county.
Ross, Hugh H.,	Fifteenth and Brown st.,	Philadelphia.
Ross, James F.,	2167 East Cumberland st.,	Philadelphia.
Ross, Jesse L.,	Waynesburg,	Greene county.
Ross, Mary J.,	Elizabethtown,	Lancaster county.
Ross, R. S.,	Elizabethtown,	Lancaster county.
Ross, William H.,	North East,	Erie county.
Ross, William R.,	Lebanon,	Lebanon county.
Rossman, George A.,	39 Market street,	Sunbury.
Roth, Samuel G. J.,	154 North Eleventh street,	Philadelphia.
Rothermel, John P.,	Lewistown,	Mifflin county.
Rothrock, D. R.,	New Berlin,	Union county.
Rothrock, Marand,	Mt. Pleasant Mills,	Snyder county.
Rothwell, Walter,	Willow Grove,	Montgomery county.
Rott, Louis,	Homestead,	Allegheny county.
Rowand, A. H. C.,	3704 Spring Garden street,	Philadelphia.
Rowand, George W.,	423 Wyandotte street,	South Bethlehem.
Rowe, William C.,	29st and Columbia ave.,	Philadelphia.
Rowse, Thomas J.,	Pottsville,	Schuylkill county.
Royer, George S.,	Ephrata,	Lancaster county.
Ruan, James,	1328 E. Susquehanna av.,	Philadelphia.
Rudolph, John M.,	Tenth and Mifflin streets,	Philadelphia.
Rudy, Jacob A.,	1000 South Second street,	Philadelphia.
Rudy, Martin,	2 West King street,	Lancaster.
Ruegenberg, John M.,	2621 Girard avenue,	Philadelphia.
Ruff, Jennie H.,	Ruffs Dale,	Westmoreland county.
Ruff, Quincy A.,	Ruffs Dale,	Westmoreland county.
Ruff, U. Gilbert,	Sixth and Thompson sts.,	Philadelphia.
Ruhl, Harry F.,	Manheim,	Lancaster county.
Rumsey, Walter A.,	920 North Forty-first st.,	Philadelphia.
Russel, Jacob P.,	900 South Tenth street,	Philadelphia.
Russell, Thomas J.,	Erie,	Erie county.
Rutherford, Charles A.,	Tenth and Reed streets,	Philadelphia.
Rutherford, Frank P.,	3364 Lancaster avenue,	Philadelphia.
Ryan, David S.,	Penn ave. and Spruce st.,	Scranton.
Ryan, Frank G.,	145 North Tenth street,	Philadelphia.
Ryan, George W.,	205 North Broad street,	Philadelphia.
Ryckman, Levi M.,	Export,	Westmoreland county.
Ryland, George B.,	227 South Tenth street,	Philadelphia.
Rynard, Charles W.,	362 Race street,	Harrisburg.
Saalfrank, Chas. William,	Lawndale,	Philadelphia.
Saalfrank, Louis,	431 Market street,	Pittsburg.
Saeger, George C.,	Montoursville,	Lycoming county.
Sager, E. S.,	Smithton,	Westmoreland county.
Sahm, Louis N.,	1800 N. Twenty-seventh st.,	Philadelphia.
Sames, Joseph H.,	2129 Arch street,	Philadelphia.

Sample, George W.,	.....3 East Market street,	.....York.
Sampsel, James W.,	.....Penns Creek,	.....Snyder county.
Sampsel, Edmund W.,	....Mt. Carmel,	.....Northumberland county.
Sanders, J. C.,	.....Hartinsburg	.....Blair county.
Sanderson, Henry C.,	.....Scranton,	.....Lackawanna county.
Sanderson, James C.,	.....16 North Fifth street,	.....Reading.
Sanford, John T.,	.....300 Second street,	.....Warren.
Sands, Frank E.,	.....Great Bend.	.....Susquehanna county.
Sandt, George L.,	.....Brookville,	.....Jefferson county.
Sandt, Joseph P.,	.....530 Northampton street,	.....Easton.
Sargent, John H.,	.....1443 South Broad street,	.....Philadelphia.
Sartwell, Thomas L.,	.....Eldred,	.....McKean county.
Sarver, Oliver C.,	.....Greensburg,	.....Westmoreland county.
Sauer, Albert H.,	.....Third and Easts streets,	.....Allegheny.
Saurer, William H.,	.....2700 East Susquehanna av.,	.....Philadelphia.
Sawhill, Alex. F.,	.....36 Ohio street,	.....Allegheny.
Sawhill, D. Frank,	.....643 Fifth avenue,	.....Pittsburg.
Sawhill, Wesley W.,	.....643 Fifth avenue,	.....Pittsburg.
Saxton, William K.,	.....Lock Haven,	.....Clinton county.
Saybolt, George H.,	.....2205 Emerald street,	.....Philadelphia.
Saylor, Albert R.,	.....Royersford,	.....Montgomery county.
Saylor, Hattie E.,	.....Royersford,	.....Montgomery county.
Scattergood, Caleb,	.....Tenth and Locust streets,	.....Philadelphia.
Schad, Harry J. G.,	.....Tamaqua,	.....Schuylkill county.
Schad, Otto A.,	.....234 Ohio street,	.....Allegheny.
Schaefer, Adolph,	.....413 Dickinson street,	.....Philadelphia.
Schaefer, Charles H.,	.....388 Fifth avenue,	.....Pittsburg.
Schaefer, Emil A.,	.....388 Fifth avenue,	.....Pittsburg.
Schaeffle, Charles C.,	.....Lock Haven,	.....Clinton county.
Schafer, Charles A.,	.....4300 Butler street,	.....Pittsburg.
Schaffle, S. W. W.,	.....3305 Hamilton street,	.....Philadelphia.
Schalck, Anthony,	.....Ninth and Spruce streets,	.....Reading.
Schandeln, Harry,	.....533 Arch street,	.....Philadelphia.
Schearer, P. W. H.,	.....1420 Spruce street,	.....Reading.
Schenberger, George E.,	.....240 East King street,	.....York.
Scherer, Frederick,	.....2036 Webster avenue,	.....Pittsburg.
Schilling, Paul C.,	.....2801 Penn avenue,	.....Pittsburg.
Schindel, David P.,	.....113 East Franklin street,	.....Hagerstown, Md.
Schindel, Harry C.,	.....4099 Lancaster avenue,	.....Philadelphia.
Schirmer, William G.,	.....431 Market street,	.....Philadelphia.
Schlagel, Walter L.,	.....Olyphant,	.....Lackawanna county.
Schlegel, E. F.,	.....735 South Fifth street,	.....Philadelphia.
Schloboch, Cyrus T.,	.....437 Northampton street,	.....Philadelphia.
Schmickle, Chas. T.,	.....Fortieth and Locust sts.,	.....Philadelphia.
Schmidt, Adolph,	.....236 Fifth avenue,	.....McKeesport.
Schmidt, Geo. W.,	.....5201 Butler street,	.....Pittsburg
Schmidt, Henry,	.....1729 South Second street,	.....Philadelphia.
Schmieg, Joseph A.,	.....2900 Germantown avenue,	.....Philadelphia.
Schminky, Allen B.,	.....2758 North Fifteenth st.,	.....Philadelphia.
Schneider, John,	.....815 Wes Cambria street,	.....Philadelphia.
Schneider, K. C. T.,	.....1607 Vine street,	.....Philadelphia.
Schoales, Marcus A.,	.....3063 Kensington avenue,	.....Philadelphia.
Schock, Frederick A.,	.....Twenty-third and Parrish,	.....Philadelphia.
Schoenberger, August,	.....Ashland,	.....Schuylkill county.

Schoff, J. John, .....	102 South George street, York.
Schofield, Allen C., .....	15th and Susquehanna av., Philadelphia.
Schall, B. Frank, .....	1711 North 25th street, Philadelphia.
Schools, George W., .....	365 North Ninth street, Lebanon.
Schoonmeker, I. R., .....	Sayre, Bradford county.
Schott, Arthur C. V., .....	830 Liberty avenue, Pittsburg.
Schrack, Robert F., .....	1500 North 22d street, Philadelphia.
Schranun, Daniel, Jr., ....	2433 Brown street, Philadelphia.
Schreiber, John D., .....	210 North Seventh street, Allentown.
Schreiber, Phillip H., .....	3 East Market street, York.
Schroeder, Luther J., .....	Columbia, Lancaster county.
Schuckmann, Wm., .....	348 Wylie avenue, Pittsburg.
Schuenemann, Otto, .....	3029 York street, Philadelphia.
Schuetz, Chas. W., .....	Sharpsburg, Allegheny county.
Schultz, John H., .....	Tremont, Schuylkill county.
Schuster, Geo. R. W., .....	20th and Columbia ave., Philadelphia.
Schwank, A. A., .....	Second and Greene sts., Philadelphia.
Schwartz, Frederick, .....	3600 Richmond street, Philadelphia.
Schwartz, L. L., .....	Brownsville, Fayette county.
Schweitzer, Henry B., ....	2176 Wylie avenue, Pittsburg.
Schweppe, Harry L., .....	New Brighton, Beaver county.
Scott, Geo. C., .....	Franklin & Columbia av., Philadelphia.
Scott, Joel F., .....	Coal Valley, Allegheny county.
Scott, J. Harry, .....	2200 Lambert street, Philadelphia.
Scott, J. P. E., .....	818 Thompson street, Philadelphia.
Scott, Robert B., .....	1200 Poplar street, Philadelphia.
Scott, Theo. W., .....	Eighth & Walnut streets, Philadelphia.
Scraftord, Chas. O., .....	Edinboro, Erie county.
Scull, James J., .....	773 South 12th street, Philadelphia.
Scureman, Joseph B., ....	Nanticoke, Luzerne county.
Seabold, Wm. S., .....	Annaville, Lebanon county.
Seary, Wm. N., .....	318 Bainbridge street, Philadelphia.
Sechler, Harmon M., .....	201 Mill street, Danville.
Seebold, John C., .....	119 Market street, Harrisburg.
Seeler, Andrew J., .....	20th & Springgarden sts., Philadelphia.
Seeley, Hosea F., .....	2407 Fairmount avenue, Philadelphia.
Seely, M. B., .....	Nelson, Tioga county.
Segrest, Lewis F., .....	2369 E. Cumberland street, Philadelphia.
Seidel, Chas. T. W., .....	Harrisville, Butler county.
Seipel, Ledy, .....	Fourth and Poplar sts., Philadelphia.
Selss, R. S., .....	Littlestown, Adams county.
Selther, Chas. A., .....	528 Arch street, Philadelphia.
Seltz, Frederick, .....	2134 Vine street, Philadelphia.
Seltz, James E., .....	Shrewsburg, York county.
Sell, Jacob, .....	Greensburg, Westmoreland county.
Sellen, Edward C., .....	1203 South Eleventh st., Philadelphia.
Sellers, Elmer J., .....	Kutztown, Bucks county.
Sellers, S. M., .....	1115 Eleventh street, Altoona.
Sellers, Walter S., .....	Chambersburg, Franklin county.
Sellers, Wm. H., .....	133 North Eleventh st., Philadelphia.
Seltzer, Chas. J., .....	New Holland, Lancaster county.
Semple, Henry B., .....	Easton, Northampton county.
Semple, Joseph G., .....	Easton, Northampton county.
Semple, W. O., .....	Easton, Northampton county.

Senecal, E. W.,	433 Ferry street,	Easton.
Server, Oliver B.,	900 Susquehanna avenue,	Philadelphia.
Service, Alex. M.,	125 Market street,	Philadelphia.
Serville, David W.,	Bellevue,	Allegheny county.
Schaeffer, Wm. J.,	1427 E. Susquehanna av.,	Philadelphia.
Shafer, Edwin C.,	Branchtown,	Philadelphia.
Shafer, J. Adolph,	Carnot,	Allegheny county.
Shaffer, Chas. H.,	Elizabeth,	Allegheny county.
Shalcross, Jacob D.,	1828 Frankford avenue,	Philadelphia.
Shaner, Jacob D.,	Suterville,	Westmoreland county.
Shaner, James E.,	Greensburg,	Westmoreland county.
Shannon, Wm. A.,	8th & Springgarden sts.,	Philadelphia.
Shapira, Israel J. E.,	Shenandoah,	Schuylkill county.
Sharp, Edward W.,	2800 Richmond street,	Philadelphia.
Sharp, John H.,	2542 Richmond street,	Philadelphia.
Sharp, Ottis S.,	Dayton,	Armstrong county.
Sharp, Warren R.,	West Chester,	Chester county.
Sharpless, Ambrose H.,	Catawissa,	Columbia county.
Shaw, Henry B.,	1701 South 20th street,	Philadelphia.
Shaw, John F.,	Girardville,	Schuylkill county.
Sheafer, E. Parke,	34th and Spruce streets,	Philadelphia.
Shearer, Alfred L.,	Duncannon,	Perry county.
Shearer, Edgar Y.,	149 E. 71st street,	New York.
Shearer, Niles H.,	York,	York county.
Sheehan, R. Y.,	Mehoopany,	Wyoming county.
Sheely, Edward V.,	19th and Chestnut sts.,	Philadelphia.
Sheets, Geo. F.,	1115 Seventh ave.,	Beaver Falls.
Sheetz, Henry W.,	South Bethlehem,	Northampton county.
Sheffler, James S.,	Pen Argyle,	Northampton county.
Shelar, J. W.,	Alverton,	Westmoreland county.
Shelley, Jacob A.,	4201 Ridge avenue,	Philadelphia.
Shenk, John B.,	2336 Coal street,	Philadelphia.
Shenkel, Michael R.,	Phoenixville,	Chester county.
Shepley, Howard P.,	Blairsville,	Indiana county.
Sheriden, James H.,	South Bethlehem,	Northampton county.
Shields, Joseph,	Punxsutawney,	Jefferson county.
Shlmer, Arthur B.,	Martin's Creek,	Northampton county.
Shindel, John G.,	Middleburg,	Snyder county.
Shingle, Geo. W.,	600 North Eleventh st.,	Philadelphia.
Shingle, Samuel H.,	1444 North 19th street,	Philadelphia.
Shinn, Howard G.,	15th and Master streets,	Philadelphia.
Shipley, E. H.,	6831 McPherson street,	Pittsburg.
Shissler, A. G.,	317 N. Shamokin street,	Shamokin.
Shissler, Henry A.,	317 N. Shamokin street,	Shamokin.
Shiveley, Frederick B.,	Fayetteville,	Franklin county.
Shivers, Chas.,	624 Spruce street,	Philadelphia.
Shoemaker, Chas. B.,	341 North Twelfth street,	Philadelphia.
Shoemaker, Clinton L.,	22d and Vine streets,	Philadelphia.
Shoemaker, Benj., Jr.,	39th and Powelton ave.,	Philadelphia.
Shoemaker, Geo. W.,	722 Hamilton street,	Allentown.
Shomberg, Albert F.,	12th avenue and 12th st.,	Altoona.
Shookers, Tobias S.,	Mountville,	Lancaster county.
Shope, Jacob,	Hummelstown,	Dauphin county.
Shore, Thos. W.,	2300 North 21st street,	Philadelphia.

Showalter, Joseph B.,	Chicora,	Butler county.
Shreives, Chas. D.,	Norwood,	Delaawre county.
Shrom, Chas. B.,	Greenville,	Mercer county.
Shrom, Henry N.,	Greenville,	Mercer county.
Shryock, Allen,	1129 Mt. Vernon street,	Philadelphia.
Shugar, Wm. G.,	635 Cumberland street,	Lebanon.
Shuler, Howard A. S.,	Liverpool,	Perry county.
Shuler, Samuel M.,	Liverpool,	Perry county.
Shull, David F.,	3928 Market street,	Philadelphia.
Shull, Silas H.,	16 North Thirteenth st.,	Philadelphia.
Shumaker, Jesse B.,	Beaver,	Beaver county.
Shumaker, Philip W.,	New Bethlehem,	Clarion county.
Shunk, Daniel P.,	Passayunk & Wash n av.,	Philadelphia.
Sibbald, John,	Fox Chase,	Philadelphia.
Sible, Lewis A.,	3d ave. and Broad st.,	Johnstown.
Sickler, Frederick V.,	Mill City,	Wyoming county.
Sickler, Harvey, 2d.,	Tunkhannock,	Wyoming county.
Sickler, Samuel H.,	1204 Providence road,	Scranton.
Siddall, Wm. F.,	1914 North street,	Philadelphia.
Sides, Howard B.,	Dowingtown,	Chester county.
Sieger, Clinton W.,	Seigfried Bridge,	Northampton county.
Siegfried, Henry J.,	College and Ellsworth sts.,	Pittsburg.
Siegfried, Howard J.,	4676 Frankford ave.,	Philadelphia.
Siegfried, John M.,	Warren,	Warren county.
Sielling, James,	194 Federal street,	Allegheny.
Sierer, John,	3925 Germantown avenue,	Philadelphia.
	3 South 22d street,	Philadelphia.
Simes, W. L.,	13 South 13th street,	Philadelphia.
Simmonds, Annie,	5 Market street,	Shamokin.
Simmonds, Thos. F.,	5 Market street,	Shamokin.
Simmons, Chas. B.,	Oil City,	Venango county.
Simons, Otto, Jr.,	818 New Market street,	Philadelphia.
Simos, Robert,	6203 Saybrook avenue,	Philadelphia.
Simpson, Robert,	1711 Vine street,	Philadelphia.
Simpson, Robert A.,	Nonth Clarendon,	Warren county.
Singer, J. Anson,	Forty Fort,	Luzerne county.
Singer, Robert L.,	333 Market street,	Harrisburg.
Sire, Geo. W.,	Carlisle,	Cumberland county.
Sipe, John E.,	Carlisle,	Cumberland county.
Sitgreaves, Wesley C.,	2600 W. Cumberland st.,	Philadelphia.
Sitler, Alpheus,	2631 Carson street,	Pittsburg.
Skelton, Chas. R.,	801 North 45th street,	Philadelphia.
Skelton, W. O.,	Sheffield,	Warren county.
Skinmer, Harry W.,	1410 Chestnut street,	Philadelphia.
Slater, James B.,	Johnstown,	Cambria county
Slaughter, John V.,	6th and Germantown av.,	Philadelphia.
Slemmer, Edward,	1803 Girard avenue,	Philadelphia.
Slick, Geo. C.,	50 North Main street,	Pittston.
Slick, Ross M.,	65th and Haverford av.,	Philadelphia.
Slifer, Levi K.,	Germant'n av. & Tioga st.,	Philadelphia.
Sloan, E. M.,	226 Allegheny avenue,	Allegheny.
Slough, Agnes M.,	245 Hamilton street,	Allentown.
Slough, Frank J.,	845 Hamilton street,	Allentown.

Slough, Minnie H. A.,	.....	845 Hamilton street,	.....	Allentown.
Smart, Clarence W.,	.....	28 Anderson street,	.....	Philadelphia.
Smart, Thos. H.,	.....	1021 Girard avenue,	.....	Philadelphia.
Smedley, Bennett L.,	.....	2050 Vine street,	.....	Philadelphia.
Smiley, Edwin R.,	.....	5500 Vine street,	.....	Philadelphia.
Smink, Robert W.,	.....	309 West Spruce street,	.....	Shamokin.
Smink, Wm. H. R.,	.....	Shamokin,	.....	Northumberland county.
Smith, Albert H.,	.....	3428 Frankford avenue,	.....	Philadelphia.
Smith, Alvin R.,	.....	Girard,	.....	Erie county.
Smith, Beaton,	.....	Seventh and Pine sts.,	.....	Wilmington, Del.
Smith, Benj. F.,	.....	1851 Franklin Place,	.....	Harrisburg.
Smith, Byron A.,	.....	1726 Peach street,	.....	Erie.
Smith, Chas. Adam,	.....	Obolds,	.....	Berks county.
Smith, Chas. H.,	.....	Uniontown,	.....	Fayette county.
Smith, Christopher C.,	.....	4529 Frankford avenue,	.....	Philadelphia.
Smith, Clarence C.,	.....	Camptown,	.....	Bradford county.
Smith, Clarence T.,	.....	117 E. Cumberland street,	.....	Philadelphia.
Smith, Daniel W.,	.....	West Moshannon,	.....	Clearfield county.
Smith, Dennis C.,	.....	Guys Mills,	.....	Crawford county.
Smith, Edward W.,	.....	764 West Fourth street,	.....	Williamsport.
Smith, Eugene F.,	.....	Scranton,	.....	Lackawanna county.
Smith, Frank,	.....	Millertown,	.....	Tioga county.
Smith, Frederick A.,	.....	Spring Creek,	.....	Warren county.
Smith, Frederick W.,	.....	Erie,	.....	Erie county.
Smith, Frederick W.,	.....	603 Gray's Ferry Road,	.....	Philadelphia.
Smith, G. A.,	.....	Liberty,	.....	Tioga county.
Smith, Geo. A.,	.....	3875 Aspen street,	.....	Philadelphia.
Smith, Geo. L.,	.....	36th and Spruce sts.,	.....	Philadelphia.
Smith, Harry A.,	.....	Second and Tioga sts.,	.....	Philadelphia.
Smith, Harry E.,	.....	Parkesburg,	.....	Chester county.
Smith, Harry L.,	.....	Hazleton,	.....	Luzerne county.
Smith, Hays,	.....	809 Lincoln avenue,	.....	Pittsburg.
Smith, Henry G.,	.....	639 Hamilton street,	.....	Allentown.
Smith, Herbert B.,	.....	Bradford,	.....	McKean county.
Smith, Herbert J.,	.....	1300 South Fifth street,	.....	Philadelphia.
Smith, Horace,	.....	York,	.....	York county.
Smith, Howard M.,	.....	2445 Ridge avenue,	.....	Philadelphia.
Smith, Jacob W.,	.....	Mauch Chunk,	.....	Carbon county.
Smith, James H.,	.....	Conneautsville,	.....	Crawford county.
Smith, James T.,	.....	Sunbury,	.....	Northumberland county.
Smith, James R.,	.....	106 Buena Vista street,	.....	Allegheny.
Smith, J. C.,	.....	McKeesport,	.....	Allegheny county.
Smith, J. M.,	.....	Mansfield,	.....	Tioga county.
Smith, John C.,	.....	5147 Penn avenue,	.....	Pittsburg.
Smith, Joseph V., Jr.,	.....	1634 Columbia avenue,	.....	Philadelphia.
Smith, Judson S.,	.....	Tyrone,	.....	Blair county.
Smith, Lawrence B.,	.....	New Brighton,	.....	Beaver county.
Smith, Nathaniel,	.....	Millerstown,	.....	Tioga county.
Smith, Paul,	.....	928 Franklin street,	.....	Philadelphia.
Smith, Prescott A.,	.....	Camptown,	.....	Bradford county.
Smith, Reuben,	.....	Penfield,	.....	Clearfield county.
Smith, Robert Victor,	.....	1301 Columbia avenue,	.....	Philadelphia.

Smith, Rodney, .....	1629 Arch street, .....	Philadelphia.
Smith, Samuel M., .....	Waynesburg, .....	Greene county.
Smith, Samuel S., .....	Huntingdon, .....	Huntingdon.
Smith, Shireman F., .....	236 West Fourth street,....	Williamsport.
Smith, Sylvester S., .....	Emporium, .....	Cameron county.
Smith, Walter A., .....	1019 North Second street,...	Philadelphia.
Smith, Walter L., .....	Sharpsburg, .....	Allegheny county.
Smyser, Eugene M., .....	Wissinoming, .....	Philadelphia.
Smyser, Geo. M., .....	Chelton & Pulaski aves.,...	Germantown.
Smyser, John R., .....	40th and Lancaster ave.,...	Philadelphia.
Smyser, Willis L., .....	235 West York avenue, .	York.
Smythe, John Reid, .....	2600 Federal street, .....	Philadelphia.
Snevely, Harry B., .....	Prince and Orange sts.,...	Lancaster.
Snively, H. H., .....	Mechanicsburg, .....	Cumberland county.
Snodgrass, David G., .....	Conneaut Lake, .....	Crawford county.
Snodgras, Frank, .....	Washington, .....	Washington county.
Snyder, Bertram, .....	830 Chestnut street, .....	Philadelphia.
Snyder, Frank H., .....	Mahanoy City, .....	Schuylkill county.
Snyder, Howard G., .....	2102 Centre avenue, .....	Pittsburg.
Snyder, John N., .....	Somerset, .....	Somerset county.
Snyder, Jonathan W., .....	Mahanoy Cty, .....	Schuylkill county.
Snyder, Myron T., .....	Hawley, .....	Wayne county.
Snyder, Plymouth W., .....	Hollidaysburg, .....	Blair county.
Snyder, R. R., .....	Shippenville, .....	Clarion county.
Sonntag, Maximilian, .....	Ninth and Noble sts.,...	Philadelphia.
Sorber, Louis S., .....	Eighth and Oxford sts.,...	Philadelphia.
Sorg, Albert M., .....	5652 Rural avenue, .....	Pittsburg.
Souder, Joseph A., .....	1913 South 13th street, ...	Philadelphia.
Southwick, Eugene P., ....	Bradford, .....	McKean county.
Sowash, Geo., .....	Irwin, .....	Westmoreland county.
Sowash, S. J., .....	Slippery Rock, .....	Butler county.
Spaeth, Julius, .....	Carbondale, .....	Lackawanna county.
Spalding, Geo. M., .....	Wellsboro, .....	Tioga county.
Spalding, Mcrall G., .....	Mt. Jewett, .....	McKean county.
Spang, Chas. A., .....	275 Ridge avenue, .....	Allegheny.
Spangler, G. E., .....	502 Arch street, .....	Philadelphia.
Spangler, Jacob, .....	Chambersburg, .....	Franklin county.
Spangler, T. G., .....	602 Arch street, .....	Philadelphia.
Sparkes, Samuel J., .....	Montrose, .....	Susquehanna county.
Sparks, Edgar R., .....	2327 Brown street, .....	Philadelphia.
Sparkling, Wyndham, .....	Monaca, .....	Beaver county.
Spath, Geo. B., .....	Dillsburg, .....	York county.
Spayd, Chas. W., .....	159 East Market street,....	Wilkes-Barre.
Speakman, Wm. E., .....	528 Arch street, .....	Philadelphia.
Speer, Edgar L., .....	345 East Queen street, ....	Chambersburg.
Speer, James F., .....	18th and Lombard sts., ...	Philadelphia.
Speer, John D. P., .....	63 Irwin avenue, .....	Allegheny.
Spelcher, A. F., .....	Elk Lick, .....	Somerset county.
Spenceley, C. E., .....	1401 North Seventh st.,...	Philadelphia.
Spencer, Edward, .....	1631 Arch street, .....	Philadelphia.
Spencer, Edwin F., .....	Hastings, .....	Cambria county.
Spencer, Frederick M., ....	Honesdale, .....	Wayne county.



Spengler, Aaron, ..... South Easton, ..... Northampton county.  
 Spickler, Walter S., ..... 336 S. Second street, ..... Philadelphia.  
 Spilker, Henry A., ..... Pittsburg.  
 Splane, Chas. U., ..... 6736 Simon avenue E. E., ..... Pittsburg.  
 Spohn, Jacob, ..... 39 Shiloh street, ..... Pittsburg.  
 Spotts, Albert O., ..... 52d and Master street, .... Philadelphia.  
 Spragle, Elmer, ..... Bartonsville, ..... Monroe county.  
 Sprecker, Henry F., ..... 603 Montgomery avenue, .. Philadelphia.  
 Sprenger, Wm. Alfred, ..... Second and Green streets, Philadelphia.  
 Springer, Everett F., ..... North Belle Vernon, ..... Westmoreland county.  
 Springer, R. Eathan, ..... Uniontown, ..... Fayette county.  
 Sprissler, Clara, ..... Ninth and South sts., .... Philadelphia.  
 Sprissler, Oscar, ..... 1600 N. Eighth street, .... Philadelphia.  
 Sprisler, Theodore, ..... 601 S. Ninth street, ..... Philadelphia.  
 Sprouls, Wm. W., ..... Houstonville, ..... Washington county.  
 Stackhouse, Wm. M., ..... Emille, ..... Bucks county.  
 Stahler, Eugene A., ..... Bridgeport, ..... Montgomery county.  
 Stahler, Harry L., ..... Main and Swede sts., .... Norristown.  
 Stahler, Wm., ..... Main and Swede sts., .... Norristown.  
 Staley, James, ..... 737 Fifth avenue, ..... McKeesport.  
 Staley, Sarah M., ..... 737 Fifth avenue, ..... McKeesport.  
 Stallman, Harry R., ..... Haws ave. and Airy st., .. Norristown.  
 Stanley, Alfred G., ..... Lykens, ..... Dauphin county.  
 Stansburg, Wilson V., .... Wishart & Frankford avs., Philadelphia.  
 Stanton, Thos. J., ..... 1900 Greene st., ..... Philadelphia.  
 Staples, Byron E., ..... Jersey Shore, ..... Lycoming county.  
 Starck, Albert A. G., ..... 160 Girard ave., ..... Philadelphia.  
 Stark, Malon S., ..... Dunmore, ..... Lackawanna county.  
 Starr, John W., ..... Millersburg, ..... Dauphin county.  
 Stathen, Beach J., ..... 1801 Master street, ..... Philadelphia.  
 Statler, Chas. H., ..... 4 Walnut street, ..... Johnstown.  
 Stauffer, Benj. W., ..... Campbelltown, ..... Lebanon county.  
 Stauffer, Wm. H., ..... Spring City, ..... Chester county.  
 St. Clair, Theo. A., ..... 362 N. Thirty-Ninth st., .. Philadelphia.  
 Stearns, John C., ..... Mifflinburg, ..... Union town.  
 Stearn, Isaac, ..... 428 S. Fifth street, ..... Philadelphia.  
 Stearn, Moses, ..... 428 S. Fifth street, ..... Philadelphia.  
 Steck, Chas. T., ..... Berwick, .....  
 Stedhem, Frederick W. E., Broad and Fairmount av., Philadelphia.  
 Stedhem, L. S. A., ..... 351 N. Eleventh street, .... Philadelphia.  
 Steel, Wm. H., ..... 633 N. Ninth street, .... Philadelphia.  
 Steele, Hurbert A., ..... Sturgeon, ..... Allegheny county.  
 Steele, Wm. A., ..... 32 Federal street, ..... Allegheny.  
 Steelman, Peter, ..... 941 S. Sixth street, ..... Philadelphia.  
 Steen, James H., ..... Conshohocken, ..... Montgomery county.  
 Steever, Aaron M., ..... Sixth and Boas sts., ..... Harrisburg.  
 Stever, Chas. C., ..... Millersburg, ..... Dauphin county.  
 Steever, E. W., ..... Millersburg, ..... Dauphin county.  
 Stein, Jacob H., ..... 801 Penn street, ..... Reading.  
 Stein, Matthew R., ..... Mahanoy City, ..... Schuylkill county.  
 Steinmetz, C. M., ..... 428 N. Fifth street, ..... Reading.  
 Steinmetz, William F., ..... 2838 Girard avenue, ..... Philadelphia.  
 Steitz, Louis, ..... 157 Pennsylvania avenue, .. Allegheny.

Steltz, Harry S.,	20th and Columbia ave.,	Philadelphia.
Steltzer, Lewis J.,	2450 N. Sixth street,	Philadelphia.
Steltzer, Nathan S.,	701 Cambria street,	Philadelphia.
Stem, W. Nelson,	20th and Callowhill sts.,	Philadelphia.
Stenger, Bernard J.,	601 Carson street,	Pittsburg.
Stenger, Joseph W.,	Mt. Oliver,	Allegheny county.
Stephen, Mrs. Annie R.,	947 Penn avenue,	Reading.
Stephen, Walker L.,	525 Elm street,	Reading.
Stephen, Willis L.,	947 Penn avenue,	Reading.
Stephens, Edward F.,	McKeesport,	Allegheny county.
Stephens, H. D. F.,	302 Mickle street,	Camden, N. J.
Stermer, John H.,	Seventh and Oxford sts.,	Philadelphia.
Sterner, Oliver H.,	Frankford,	Philadelphia.
Sterrett, Robert M.,	3130 Penn avenue,	Pittsburg.
Stevens, Atherton B.,	South Canaan,	Wayne county.
Stevens, Bessie E.,	627 Copeland street,	Pittsburg.
Stevens, Edward H.,	Laceyville,	Lycoming county.
Stevens, John C.,	230 S. Thirteenth st.,	Harrisburg.
Stevens, Wm. A.,	Hamletton,	Wayne county.
Stevens, Wm. B.,	Nelson,	Tioga county.
Stevenson, Fred. L.,	1432 Master street,	Philadelphia.
Stevenson, Geo. F.,	316 N. Eighth street,	Philadelphia.
Stevenson, J. F.,	Osgood street,	Allegheny.
Stevenson, John V.,	Greensburg,	Westmoreland county.
Stevenson, Silas,	Ellwood City,	Lawrence county.
Stewart, Albert H.,	Sharon,	Mercer county.
Stewart, Henry C.,	4434 Lancaster avenue,	Philadelphia.
Stewart, John H.,	DuBols,	Clearfield county.
Stewart, Samuel,	77 Ohio street,	Allegheny.
Stewart, Thomas D.,	Delta,	York county.
Stichter, Henry D.,	2900 Germantown avenue,	Philadelphia.
Stiefel, Ernest C.,	59 Fulton street,	Pittsburg.
Stiles, Henry A.,	Ulster,	Bradford county.
Stiles, Henry C.,	601 North Thirty-third st.,	Philadelphia.
Stiles, Thomas J.,	Berwick,	Columbia county.
Stineman, Jacob J.,	267 Wolf street,	Philadelphia.
Stoffregen, Louis F.,	308 North Centre street,	Pottsville.
Stoke, H. Alex.,	Reynoldsville,	Jefferson county.
Stokely, Nehemiah,	1101 Wylie avenue,	Pittsburg.
Stone, Charles W.,	Sabinsville,	Tioga county.
Stone, Lewis J.,	Sabinsville,	Tioga county.
Stone, Nathaniel,	Corry,	Erie county.
Stoner, William J.,	Leechburg,	Armstrong county.
Storey, Alex. W.,	Karns City,	Butler county.
Storm, William,	Cochrannton,	Crawford county.
Stout, Edward C.,	Fifth and Greenwood av.,	Philadelphia.
Stout, John H.,	Milton,	Northumberland county.
Stout, Lemuel,	13 South Thirteenth street,	Philadelphia.
Stout, William S.,	Greensburg,	Westmoreland county.
Stover, J. M.,	Chester,	Delaware county.
Stoy, G. A. B.,	Waynesburg,	Greene county.
Strasser, Thomas A.,	914 Penn street,	Reading.
Stratton, Albert G.,	938 South Eighth street,	Philadelphia.
Stratton, Frank G.,	Strattonville,	Clarion county.

Stratton, George, ..... Linesville, ..... Crawford county.  
 Streeter, Frank P., ..... Chestnut Hill, ..... Philadelphia.  
 Streeter, N. D., ..... 2600 North Twelfth street, Philadelphia.  
 Stretch, John, Jr., ..... 277 Federal street, ..... Allegheny.  
 Stright, Alex. P., ..... Coal Bluff, ..... Washington county.  
 Stright, Stephen A., ..... Coal Bluff, ..... Washington county.  
 Stroh, George D., ..... Pittston, ..... Luzerne county.  
 Strohecker James F., .... Beavertown, ..... Snyder county.  
 Strohm, Theodore B., .... Mt. Holly Springs, ..... Cumberland county.  
 Strott, John, ..... 1251 Penn avenue, ..... Pittsburg.  
 Strop, Freeman P., ..... Twelfth and Vine streets, Philadelphia.  
 Stroup, John C., ..... Elizabethtown, ..... Dauphin county.  
 Stroup, Joseph H., ..... 1231 North Twelfth street, Philadelphia.  
 Strouse, Theodore H., .... 3126 Columbia avenue, ... Philadelphia.  
 Strunk, Lewis C., ..... 139 Brown street, ..... Philadelphia.  
 Strunk, Samuel W., ..... 1800 North Eighteenth st., Philadelphia.  
 Strunz, Christ. E., ..... Shiloh and Sycamore sts., Philadelphia.  
 Stryker, Leslie R., ..... Corydon, ..... Warren county.  
 Stuart, Andrew J., ..... 33 Carey avenue, ..... Wilkes-Barre.  
 Stuart, Jesse E., ..... Athens, ..... Bradford county.  
 Struckert, Herman H., ... 639 Hamilton street, ..... Allentown.  
 Stucky, Emil G., ..... 2401 Penn street, ..... Pittsburg.  
 Stump, Adam F. M., ..... Womelsdorf, ..... Berks county.  
 Sturdevant, D. W., ..... Laceyville, ..... Wyoming county.  
 Sturgeon Walter J., .... Kittanning, ..... Armstrong county.  
 Stybr, Emil J., ..... 25 Chestnut street, ..... Allegheny.  
 Suess, John P., ..... 31 West Fourth street, ... Williamsport.  
 Suloff, Samuel H., ..... Patterson, ..... Juniata county.  
 Sulzback, Herry M., ..... 618 N Thirty-third street, Philadelphia.  
 Sunderland, Henry, ..... 1252 South Thirteenth st., Philadelphia.  
 Supplee, Isaac M., ..... 665 North Eighteenth st., Philadelphia.  
 Supplee, Jesse L., ..... Thirteenth and Green sts., Philadelphia.  
 Supplee, William E., ..... 665 North Elighth street, .. Philadelphia.  
 Sutliff, Sidney W., ..... Nanticoke, ..... Luzerne county.  
 Sutton, George S., ..... Jeannette, ..... Westmoreland county.  
 Sutton, Samuel, ..... 764 West Fourth street, .. Williamsport.  
 Sutton, William H., ..... 5th and Susquehanna av., Philadelphia.  
 Swain, Edward T., ..... Renovo, ..... Clinton county.  
 Swain, Harry, ..... Third and Snyder ave., .. Philadelphia.  
 Swainbank, Harry H., .... 72 South Main street, .... Wilkes-Barre.  
 Swainbank, Charles M., .. 72 South Main street, .... Wilkes-Barre.  
 Swarger, E. F. D., ..... 1545 Sixth street, ..... Harrisburg.  
 Swartley, Harry C., ..... 1410 Chestnut street, ..... Philadelphia.  
 Swarts, William J., ..... North East, ..... Erie county  
 Swartz, Calvin I., ..... Wilmington ..... Delaware.  
 Swartz, Charles M., ..... Hughesville, ..... Lycoming county.  
 Swartz, Edward F., ..... Mahanoy City, ..... Schuylkill county.  
 Swartz, John R., ..... Hughesville, ..... Lycoming county.  
 Sweeley, William, ..... Williamsport, ..... Lycoming county.  
 Sweeney, Charles W., .... 4400 Germantown avenue, Philadelphia.  
 Swope, G. E., ..... Newville, ..... Cumberland county.  
 Szlupas, John, ..... 421 Penn avenue, ..... Scranton.  
 Tafel, Adolph L., ..... 1011 Arch street, ..... Philadelphia.  
 Tafel, Edward F., ..... 67 Ohio street, ..... Allegheny.

Tagg, William, .....	1900 Judson Place, .....	Philadelphia.
Taggart, David, .....	Frackville, .....	Schuylkill county.
Taggart, George C., .....	225 North Ninth street, ..	Philadelphia.
Tall, Thomas A., Jr., .....	706 Crosby street, .....	Chester.
Taney, John M., .....	401 Franklin street, .....	Johnstown.
Tannehill, Manoah, .....	Confluence, .....	Somerset county.
Tassel, W. H., .....	Shingle House, .....	Potter county.
Taylor, Alfred B., .....	2338 North Sixth street, ...	Philadelphia.
Taylor, Claude E., .....	Forest City, .....	Susquehanna county.
Taylor, Coe S., .....	1000 Lehigh avenue, .....	Altoona.
Taylor, Elbridge G., .....	Meadville, .....	Crawford county.
Taylor, Elijah L., .....	2014 Broad street, .....	Altoona.
Taylor, George H., .....	17 North Eleventh street, ..	Philadelphia.
Taylor, Horace B., .....	Tenth and Callowhill sts., ..	Philadelphia.
Taylor, Howard D., .....	Ocean City, .....	New Jersey.
Taylor, John D., .....	2040 South Thirteenth st., ..	Philadelphia.
Taylor, Joseph Y., .....	2338 North Sixth street, ..	Philadelphia.
Taylor, Merle H., .....	Wylie av. & Chatham st., ..	Pittsburg.
Taylor, Millard F., .....	Leechburg, .....	Armstrong county.
Taylor, W. Carroll, .....	Spring City, .....	Chester county.
Taylor, W. Clark, .....	Vineland, .....	New Jersey.
Tea, George W., .....	3400 Penn avenue, .....	Pittsburg.
Temple, Frank M., .....	Fairview, .....	Erie county
Templeton, S. M., .....	Washington, .....	Washington county.
Terne, Henry B., .....	1512 South 6th street, .....	Philadelphia.
Terppe, Frederick L., .....	729 Cedar avenue, .....	Scranton.
Test, Ellwood A., .....	2683 Frankford avenue, ..	Philadelphia.
Thatcher Jesse P., .....	West Chester, .....	Chester county.
Thayer, Edward M., .....	90 Canal street, .....	Philadelphia.
Thomas, Albert D., .....	Forty Fort, .....	Luzerne county.
Thomas, Daniel J., .....	209 Lackawanna avenue, ..	Scranton.
Thomas, Frank B., .....	Myersdale, .....	Somerset county.
Thomas, George M., .....	Derry Station, .....	Westmoreland county.
Thomas, Harry F., .....	Greensburg, .....	Westmoreland county.
Thomas, Howard E., .....	2051 Camac street, .....	Philadelphia.
Thomas, Howard N., .....	Thomas, .....	Washington county.
Thomas, James D., .....	Evans City, .....	Butler county.
Thomas, James M., .....	Thomas, .....	Washington county.
Thomas, Thomas D., .....	Lehighton, .....	Carbon county.
Thomas, V. F., .....	Evans City, .....	Butler county.
Thompson, Benj. S., .....	22 South Eleventh street, ..	Philadelphia.
Thompson, Charles, .....	645 East Market street, ..	Scranton.
Thompson, Charles A., .....	Irwin, .....	Westmoreland county.
Thompson, E. F., .....	1920 Race street, .....	Philadelphia.
Thompson, Edward J., .....	Erie, .....	Erie county
Thompson, Frank F., .....	21st and Norris streets, ...	Philadelphia.
Thompson, George W., .....	Titusville, .....	Crawford county.
Thompson, Harry M., .....	Carnegie, .....	Allegheny county.
Thompson, Harry M., .....	2272 Second avenue, .....	Pittsburg.
Thompson, Isaac N., .....	North Hope, .....	Butler county.
Thompson, James S., .....	Union City, .....	Erie county.
Thompson, John R., .....	Hookstown, .....	Beaver county.
Thompson, John R., .....	2272 Second avenue, .....	Pittsburg.
Thompson, Joseph B., .....	Gap, .....	Lancaster county.

Thompson, Lester A., .... Mahaffey.  
 Thompson, Melville S., ... Coudersport, ..... Potter county.  
 Thompson, Samuel H., .... Philadelphia.  
 Thompson, Samuel Y., ... Danville, ..... Montour county.  
 Thompson, William B., ... 1700 Mt. Vernon street, .. Philadelphia.  
 Thompson, William C., ... Coatesville, ..... Chester county.  
 Thompson, William F., ... 1304 Derry street, ..... Harrisburg.  
 Thorley, J. D., ..... Ridge Road, ..... Harrisburg.  
 Thorley, Thomas A., ..... 449 State street, ..... Harrisburg.  
 Thorn, P. D., ..... Mahanoy City, ..... Washington county.  
 Thornton, Thomas R., ... 720 North Tenth street, ... Philadelphia.  
 Thornley, Frederick C., ... 1638 Franklin street, ..... Philadelphia.  
 Thro, John M., ..... 1142 Academy street, ..... Scranton.  
 Thum, John K., ..... 641 Jackson street, ..... Philadelphia.  
 Tibbins, George H., ..... Noxan, ..... Wyoming county.  
 Tice, William B., ..... Johnstown, ..... Cambria county.  
 Tidball, Frank B., ..... New Castle, ..... Beaver county.  
 Tiefenbach, Jacob F., ... 26 North Seventh street, .. Easton.  
 Tiffany, L. Elbert, ..... Hallstead, ..... Susquehanna county.  
 Tiffany, Judson E., ..... Pleasant Mount, ..... Wayne county.  
 Tingley, J. P. A., ..... Carbondale, ..... Lackawanna county.  
 Tinsley, Grant S., ..... Wrightsville, ..... York county.  
 Tobey, F. W., ..... 730 State street, ..... Erie.  
 Tobias, Joseph K., ..... Ephrata, ..... Lancaster county.  
 Toboldt, L. E. F., ..... 1201 Columbia avenue, ... Philadelphia.  
 Todd, Bela B., ..... 1128 Seventh avenue, .... Beaver Falls.  
 Todd, Harry B., ..... 140 Tioga avenue, ..... Pittsburg.  
 Todd, James C., ..... 4403 Main street, ..... Manayunk.  
 Todd, William C., ..... 4403 Main street, ..... Manayunk.  
 Tolson, Benjamin F., ... 927 Sprign Garden street, Philadelphia.  
 Tomkinson, Horace L., ... Fifth and Greenwood av., Philadelphia.  
 Tomlin, Millard F., ..... 713 Spring Garden street, Philadelphia.  
 Tomlinson, John, ..... 4800 Westminster avenue, Philadelphia.  
 Tomlinson, Thomas C., ... Fifth and Wharton sts., Philadelphia.  
 Tomlinson, Wells, ..... 2122 North Eleventh st., Philadelphia.  
 Tonson, Alfred E., ..... 824 State street, ..... Erie.  
 Toplis, William G., ..... 4939 Germantown avenue, Philadelphia.  
 Torrence, Albert, ..... 218 Market street, ..... Pittsburg.  
 Torrence, James, ..... 218 Market street, ..... Pittsburg.  
 Totten, R. M., ..... Forty-third and Butler st. Pittsburg.  
 Towler, Samuel S., ..... Irwin, ..... Westmoreland county.  
 Townsend, Addie R., ... 5130 Tacony street, ..... Frankford.  
 Townsend, Edward S., ... 431 North Fortieth street, Philadelphia.  
 Townsend, James V., ... Atlantic City, ..... New Jersey.  
 Traut, Henry G., ..... Girard, ..... Erie county.  
 Treichler, Claudius G., ... Honey Brook, ..... Chester county.  
 Treichler, L. A., ..... 4677 Germantown avenue, Philadelphia.  
 Trenchard, John F., ..... 2502 Richmond street, ... Philadelphia.  
 Tribby, Elmer E., ..... 5213 Fifth avenue, ..... Pittsburg.  
 Trist, Edwin A., ..... 928 South Ninth street, ... Philadelphia.  
 Troop, William W., ..... 320 North Ninth street, .. Reading.  
 Troth, Frank D., ..... Knoxville, ..... Allegheny county.  
 Trout, Charles C., ..... Girardville, ..... Schuylkill county.  
 Trout, Nicholas C., ..... Fairfield, ..... Adams county.  
 Trout, William F., ..... McConnellsburg, ..... Fulton county.

Trout, Winfield S.,	4060 Haverford street,	Philadelphia.
Trout, Zachary T.,	Girardville,	Schuylkill county.
Troutman, George F.,	Centralla,	Columbia county.
Truckenmiller, F. E.,	Watsonstown,	Northumberland county.
Trumbauer, Henry T.,	Coopersburg,	Lehigh county.
Trupp, Louis,	Eighth and Poplar sts.,	Philadelphia.
Tuck, Henry C.,	7 South Main street,	Wilkes-Barre.
Tuck, William H.,	108 Hazle avenue,	Wilkes-Barre.
Turner, Alexander,	1558 North Eleventh street,	Philadelphia.
Turner, Dudley H.,	Towanda,	Bradford county.
Turner, Herbert W.,	1018 Twelfth street,	Altoona.
Turner, Philip P.,	Fifth and Jackson streets,	Philadelphia.
Turtle, Alfred,	Crafton,	Allegheny county.
Tustin, Joseph C.,	Bustleton,	Philadelphia.
Tyler, George C.,	1900 Green street,	Philadelphia.
Tyler, Watson,	Shamokin,	Northumberland county.
Ueberoth, H. M.,	Bethlehem,	Northampton county.
Uhler, S. P.,	133 Cattell street,	Easton.
Ulmer, Stephen E.,	409 South Eighth street,	Philadelphia.
Ulish, J. Howard,	Sellinsgrove,	Snyder county.
Umstead, Walter H.,	20th and Christian sts.,	Philadelphia.
Unangst, Eugene P.,	Bethlehem,	Northampton county.
Urban, B. F. W.,	312 South Queen street,	Lancaster.
Urban, Charles L.,	Locust and Fulton street,	Allegheny.
Urban, Fred. L.,	2131 Carson street,	Pittsburg.
Urban, Henry A.,	2131 Carson street,	Pittsburg.
Urban, Joseph P.,	Locust and Fulton streets,	Allegheny.
Urquhart, George W.,	3646 North Broad street,	Philadelphia.
Usilton, Charles A.,	1500 South Ninth street,	Philadelphia.
Utech, Philip H.,	Meadville,	Crawford county.
Vanasdale, David A.,	81 Taggart street,	Philadelphia.
Van Buskirk, Samuel L.,	822 West Lehigh avenue,	Philadelphia.
VanCamp, Joshua E.,	Plainfield,	Cumberland county.
Vance, William Samuel,	246 East Beaux street,	Washington.
Vanderbeck, James A.,	602 South Second street,	Philadelphia.
Vandergrift, Wm. H. T.,	Bridesburg,	Philadelphia.
VanDyke, Arthur D.,	Marysville,	Perry county.
VanDyke, James,	Sunbury,	Northumberland county.
VanDyke, William C.,	Twentieth and Tloga sts.,	Philadelphia.
VanKork, William,	410 Spruce street,	Philadelphia.
VanNort, William A.,	2011 North Eighteenth st.,	Philadelphia.
VanNoten, Robert E.,	Cooperstown,	Venango county.
VanValzah, John A.,	Hughesville,	Lycoming county.
VanValzah, S. L.,	Hughesville,	Lycoming county.
Varmilya, Sherman S.,	Grover,	Bradford county.
Vernon, Mary G.,	Clifton Heights,	Delaware county.
Vetter, Mary E.,	415 Penn avenue,	Scranton.
Vetter, Philip J.,	415 Penn avenue,	Scranton.
Vischer, C. A. Otto,	1216 Girard avenue,	Philadelphia.
Vockrodt, G. A.,	1719 Fifth avenue,	Pittsburg.
Vogel, Louis H.,	26 Mayflower street,	Pittsburg.
Vogelback, Edmund C.,	2332 Frankford avenue,	Philadelphia.
Vogelbach, Jacob H.,	2457 North Fifth street,	Philadelphia.
Voorhees, Charles D.,	Laporte,	Sullivan county.

Vosburg, E. Frederick, ..	Du Bois, .....	Clearfield county.
Vosburg, T. B., .....	Skinner's Eddy, .....	Wyoming county.
Voshage, Herman F., ....	29th and Herman streets,	Philadelphia.
Voshage, Louis C., .....	Ashland, .....	Schuylkill county.
Voss, T. J. G., .....	2132 North Third street, ..	Philadelphia.
Vowell, Louis S., .....	Washington, .....	Washington county.
Wagaman, Samuel E.,.....	53 North Main street, ....	Chambersburg.
Wagner, Chas. H., .....	Fourth and Berks sts., ..	Philadelphia.
Wagenseller, Geo. C., ....	Selinsgrove, .....	Snyder county.
Wagner, Geo. L., .....	2114 Master street, .....	Philadelphia.
Wagner, John O., .....	Beaver Springs, .....	Snyder county.
Waite, Thos. C., .....	City Hall, .....	Allegheny.
Waite, Wm. A., .....	Sugar Notch, .....	Luzerne county.
Waitz, Frank, .....	Flemington, .....	Clinton county.
Wakefield, Joseph C., ....	Vinco, .....	Cambria county.
Walcott, A. L., .....	24 S. Second street, .....	Philadelphia.
Waldenberger, Louis, ....	Manayunk, .....	Philadelphia.
Waldman, John, .....	Second and Green sts., ....	Philadelphia.
Walk, Elwood P., .....	Hazleton, .....	Luzerne county.
Walker, Alfred C., .....	Sewickley, .....	Allegheny county.
Walker, Francis W., Jr.,...	New Brighton, .....	Beaver county.
Walker, James, .....	144 South Main street, ....	Wilkes-Barre.
Walker, Robert A., .....	West Monterey, .....	Clarion county.
Walker, Thos. A., .....	Nineteenth & Ontario sts.,	Philadelphia.
Walker, Wm. B., .....	Clarksburg, .....	Indiana county.
Wallace, John C., .....	New Castle, .....	Lawrence county.
Wallace, Robert S., .....	East Brady, .....	Clarion county.
Wallington, Edward M.,...	1410 Chestnut stret, .....	Philadelphia.
Wallis, Alfred W., .....	2450 Fifth avenue, .....	Pittsburg.
Walks, James M., .....	2630 E. Lehigh avenue, ...	Philadelphia.
Walter, Albert B., .....	137 N. Franklin street, ...	Wilkes-Barre.
Walter, Andrew W., .....	1800 N. Twenty-seventh st.	Philadelphia.
Walter, Frederick G.,.....	Second and Green sts., ....	Philadelphia.
Walter, Wm. C., .....	684 N. Thirteenth street, ..	Philadelphia.
Walter, Wm. H., .....	1700 N. Second street, .....	Philadelphia.
Walther, Chas. L., .....	171 Chestnut street, .....	Allegheny.
Walther, Ernest T., .....	64 Chestnut street, .....	Allegheny.
Walthour, Samuel L., ....	118 South Main street, ....	Greensburg.
Walton, David R.,.....	London Grove, .....	Chester county.
Walton, Geo. R., .....	Malvern, .....	Chester county.
Walton, Lucuis L., .....	Fourth and Pine sts., ....	Williamsport.
Walz, Frank J., .....	1207 Seventh street, .....	Harrisburg.
Wamsley, James A., ....	1838 Diamond street, .....	Philadelphia.
Wamsley, James W., ....	19th and Diamond sts., ...	Philadelphia.
Ward, Ellab T., .....	843 S. Third street, .....	Philadelphia.
Ward, J. M. B., .....	Chester, .....	Delaware county.
Warfel, Wm. S., .....	72 South Main street, ....	Wilkes-Barre.
Warg, Edwin C., .....	1101 Arch street, .....	Philadelphia.
Warner, Edward E., ....	1003 S. Seventh street, ....	Philadelphia.
Warner, Ellwood B., ....	1003 S. Seventh street, ....	Philadelphia.
Warner, Wm. R., .....	1228 Market street, .....	Philadelphia.
Warner, Wm. R., Jr., ....	1228 Market street, .....	Philadelphia.
Warnock, Frank M., ....	584 Fifth avenue, .....	McKeesport.
Warren, Thos. R., .....	Elkland, .....	Tioga county.

Warrick, Georgiana, .....	Beaver Falls, .....	Beaver county.
Wasley, Annie, .....	Shenandoah, .....	Schuylkill county.
Wasley, Fred. S., .....	Shenandoah, .....	Schuylkill county.
Wasley, Harry M., .....	Shenandoah, .....	Schuylkill county.
Waterman, Benj. C., .....	3875 Aspen street, .....	Philadelphia.
Waters, Chas., .....	Pittston, .....	Luzerne county.
Waters, John B., .....	Catawissa, .....	Columbia county.
Waters, Thos. C., .....	East Stroudsburg, .....	Monroe county.
Watkins, Chas. J., .....	Olyphant, .....	Lackawanna county.
Watkins, Edmund H., ....	Kane, .....	McKean county.
Watkins, Thos. W., .....	Olyphant, .....	Lackawanna county.
Watkins, Wm. W., Jr., ....	Peckville, .....	Lackawanna county.
Watson, Chas. W., .....	2001 South street, .....	Philadelphia.
Watson, David B., .....	20 Chestnut street, .....	Allegheny.
Watson, James K., .....	McEwenville, .....	Northumberland county.
Watson, Jonathan I., ....	2600 N. Twelfth street, ....	Philadelphia.
Watson, Maurice, .....	Bristol, .....	Bucks county.
Watson, Walter W., ....	331 South Broad street, ..	Philadelphia.
Watson, Wm. C., .....	3421 Springgarden st., ....	Philadelphia.
Watson, Wm. P., .....	Clearfield, .....	Clearfield county.
Weakley, John J., .....	105 North George street, ..	York.
Weatherley, T. Ogden, ....	2664 Martha street, .....	Philadelphia.
Weaver, Geo. P., .....	6105 Woodland avenue, ...	Philadelphia.
Weaver, Jacob G., .....	Strasburg, .....	Lancaster county.
Weaver, James B., .....	705 Filbert street, .....	Philadelphia.
Weaver, Milton H., .....	Richlandtown, .....	Bucks county.
Weaver, Uriah M., .....	412 North Fourth street,...	Altoona.
Weaver, Wm. J., .....	Strasburg, .....	Lancaster county.
Weaver, Wm. W., .....	63d and Woodland ave., ..	Philadelphia.
Webb, Horace G., .....	Coral and York streets, ..	Philadelphia.
Webbert, Harry S., .....	200 South High street, ...	Mechanicsburg.
Weber, Alex. A., .....	9th and Locust Sts., ....	Philadelphia.
Weber, Antoine W., ....	6219 Penn avenue, .....	Pittsburg.
Weber, Augustus, .....	1045 South Sixth street, ..	Philadelphia.
Weber, Frank C., .....	Ambler, .....	Montgomery county.
Weber, Jacob, .....	10th and Lombard Sts., ..	Philadelphia.
Weber, Jeremiah, .....	2954 Richmond street, ....	Philadelphia.
Weber, Peter, .....	5600 Penn avenue, .....	Pittsburg.
Weber, Reinhard J., ....	700 N. 43d St., .....	Philadelphia.
Weber, Wm., .....	940 N. 11th St., .....	Philadelphia.
Webster, Samuel C., ....	Philadelphia, .....	
Wedemeyer, Fred'k G., ..	Sixth and Snyder streets, ..	Philadelphia.
Wegener, August G., ....	1201 S. 11th St., .....	Philadelphia.
Wehler, Randolph, .....	New Oxford, .....	Adams county.
Weida, Chas. A., .....	224 North Fifth street, ....	Philadelphia.
Weida, Charles, .....	Oxford and Ridge Ave., ..	Philadelphia.
Weidemann, Chas. A., ....	2148 Green street, .....	Philadelphia.
Weidner, David J., .....	12th and Jefferson Sts., ..	Philadelphia.
Weigle, Gilbert H., .....	1704 North Third street, ..	Harrisburg.
Weills, Isaac M., .....	1800 North Fourth street, ..	Harrisburg.
Weills, Wm. M. L., .....	1800 North Fourth street, ..	Harrisburg.
Wels, Wm., .....	921 Washington street, ....	Reading.
Weiser, Henry K., .....	1034 Hanover street, .....	Philadelphia.
Weiser, Spencer B., .....	Millersburg, .....	Dauphin county.



Weishaar, Harry P.,	.....234 Ohio street,	Allegheny.
Weisner, Nicholas F.,	....Leesport,	Mercer county.
Weiss, Christian,	.....600 West Girard avenue,	Philadelphia.
Weiss, Willard M.,	.....Sixth and Penn.avenue,	Pittsburg.
Welch, John M.,	.....Eldred,	McKean county.
Weller, Edward V.,	.....2 Franklin street,	Allegheny
Wells, Elmore H.,	.....Meshoppen,	Wyoming county.
Wells, Henry C.,	.....Smethport,	McKean county.
Wellman, Herbert J.,	....Cambridgeboro,	Crawford county.
Welsh, Benj. P.,	.....194 Federal street,	Allegheny.
Welsh, Robert E.,	.....153 North Tenth street,	Philadelphia.
Welshous, Wm. P.,	.....Butler,	Butler county.
Wenck, Mary A.,	.....119 East Queen street,	Northumberland county.
Wenck, Sylvanus M. G.,	..107 North Queen street,	Northumberland county.
Wenck, Wm. G.,	.....107 North Queen street,	Northumberland county.
Wendel, Wm.,	.....1926 Fountaine street,	Philadelphia.
Wenerd, John E.,	.....835 Marke street,	Philadelphia.
Wenger, I. Lincoln,	.....9 East King street,	Lancaster.
Wenner, Alfred J.,	.....Canal & Northampton sts.	Wilkes-Barre.
Wenrich, Albert B.,	.....1102 Arch street,	Philadelphia.
Werekshagen, C. A.,	.....2300 Oxford street,	Philadelphia.
Werle, Fred'k H.,	.....76 East street,	Allegheny.
Werley, Chas. D.,	.....Topton,	Berks county.
Werst, Allen L.,	.....2303 North Second street,	Philadelphia.
Wert, John M.,	.....701 N. 12th St.,	Philadelphia.
Wertman, Alvin A.,	.....Tannersville,	Monroe county.
Westerhold J. Henry,	...19 S. George street,	York.
Westgate, Benj. H.,	.....Towanda,	Bradford county.
Weston, Edythe,	.....1422 Moore street,	Philadelphia.
Wetherell, J. P.,	.....182 Lacock street,	Allegheny.
Wetherill, Abner T.,	.....1927 N. 24th St.,	Philadelphia.
Wheeler, Eno S.,	.....Nicholson,	Wyoming county.
Wheeler, Samuel A.,	.....468 South Main street,	Wilkes-Barre.
Whisler, Horace C.,	.....New Brighton,	Beaver county.
Whitacre, Lewis R.,	.....Lumberton,	New Jersey.
Whitaker, Andrew R.,	....Phoenixville,	Chester county.
Whitaker, Geo. N.,	.....Oak Lane,	Philadelphia.
Whitaker, Wm. H.,	.....865 N. 23d St.,	Philadelphia.
Whitcomb, Will H.,	.....2002 Tioga street,	Philadelphia.
White, Chas. A.,	.....Winfield avenue,	Philadelphia.
White, Chas. H.,	.....2230 North Front street,	Philadelphia.
White, Harry L.,	.....Beaver,	Beaver county.
White, Ishmeal J.,	.....2501 N. 18th St.,	Philadelphia.
White, James A.,	.....Enon Valley,	Lawrence county.
White, James T.,	.....Columbia Ave., & Frank-	
	lin street,	Philadelphia.
White, Preston B.,	.....Chambersburg,	Franklin county.
White, Robert N.,	.....Ligonier,	Westmoreland county.
Whit, Thos. L.,	.....5th Ave., and Sinclair St.,	McKeesport.
White, Wm. D.,	.....63 Public Square,	Wilkes-Barre.
White, Wm. M.,	.....1801 Wylie avenue,	Pittsburg.
White Wm. N.,	.....11th and Jackson Sts.,	Philadelphia.

Whitecar, James M.,	.....2214 N. 16th St.,	.....Philadelphia.
Whitehill, Geo. W.,	.....Yocumtown,	.....York county.
Whiteley, Edward A.,	....507 West York street,	....Philadelphia.
Whiteley, Joseph C.,	....6100 South street,	.....Philadelphia.
Whiteside, Wm. E.,	.....37th and Woodland Ave.,	Philadelphia.
Whiteman, Wm. W.,	.....Canton,	.....Bradford county
Whitsett, W. M.,	.....Fayette City,	.....Fayette county.
Whittem, Wm. A.,	.....Chestnut Hill,	.....Philadelphia.
Wickham, Anthony S.,	...1029 Market street,	.....Philadelphia.
Widdicombe, Thos. C.,	....65 Rebecca street,	.....Allegheny.
Wiegel, Chas.,	.....1906 Carson street,	.....Pittsburg.
Wiest, G. F.,	.....North Collins,	.....New York City.
Wielthorn, Herman J.,	....289 Beaver avenue,	.....Allegheny.
Wiff, Herman,	.....Sharon Hill,	.....Delaware county.
Wiike, Albert D.,	.....Marletta,	.....Lancaster county.
Wilbert, Martin I.,	.....340 N. 11th St.,	.....Philadelphia.
Wilcox, Meritt,	.....Mt. Jewett,	.....McKean county.
Wilcox, Wm.,	.....Renovo,	.....Clinton county.
Wild, C. Ferdinand,	.....127 N. 22d St.,	.....Philadelphia.
Wildman, Elias,	.....Jopkintown	.....Montgomery county.
Wiley, S. Nelson,	.....Arch and Alry streets	....Norristown.
Wilford, Geo. A.,	.....211 East Broad street	..Tamaqua.
Wilgus, Wm. A.,	.....4529 Frankford avenue,	..Philadelphia.
Wilhelm, Valentine,	.....Homestead,	.....Allegheny county.
Wilkins, Robert B.,	.....Wattsburg,	.....Erie county
Wilkins, Weston G.,	.....West Hickory,	.....Forest county.
Wilkinson, R. P.,	.....1700 Wharton St.,	.....Philadelphia.
Wilkinson, Wm. J.,	.....3017 Frankford avenue,	..Philadelphia.
Willard, Samuel B.,	.....Yeardley,	.....Bucks county.
Willard, T. N.,	.....Manayunk,	.....Philadelphia.
Williams, Chas. M.,	.....1918 Uber street,	.....Philadelphia.
Williams, Chas. P.,	.....812 Windsor square,	.....Philadelphia.
Williams, David O.,	.....812 Windsor square,	.....Philadelphia.
Williams, Frank P.,	.....New Bethlehem,	.....Clarion county.
Williams, George, Jr.,	....Beech Creek,	.....Clinton county.
Williams, Herbert F.,	....329 Rowe street,	.....Tamaqua.
Williams, James E.,	.....Freeport,	.....Armstrong.
Williams, James H.,	.....Port Allegheny,	.....McKean county.
Williams, J. Franklin,	....Greensboro,	.....Greene county.
Williams, John K.,	.....2801 Penn avenue,	.....Pittsburg.
Williams, John M.,	.....Worthington,	.....Armstrong county.
Williams, Louis H.,	.....Columbia,	.....Lancaster county.
Williams, Marcus C.,	.....18 Robinson street,	.....Allegheny.
Williams, N. B.,	.....1509 Columbia avenue,	..Philadelphia.
Williams, Nerl B.,	.....Perkasie,	.....Bucks county.
Williams, Reese D.,	.....Plymouth,	.....Luzerne county.
Williams, Richard J.,	.....Ashland,	.....Schuylkill county.
Williams, Wm. J.,	.....Peckville,	.....Lackawanna county.
Williams, Wm. T.,	.....Mt. Carmel,	.....Northumberland county.
Williamson, James,	.....25th and Jefferson Sts.,	..Philadelphia.
Willits, Chas. C.,	.....Sunbury,	.....Northumberland county.
Wilson, Adam H.,	.....Bradford,	.....McKean county.
Wilson, Alexander,	.....1861 North Front street,	..Philadelphia.

Wilson, Edward, ..... Plymouth, ..... Luzerne county.  
 Wilson, E. Ellsworth, .... 153 W. Huntingdon street, Philadelphia.  
 Wilson, John M., ..... New Florence, ..... Westmoreland county.  
 Wilson, John S., ..... 120 West York street, .... Philadelphia.  
 Wilson, Laban, ..... Fifth and Market streets, East Liverpool.  
 Wilson, Matthew J., ..... Front and Berks street, .. Philadelphia.  
 Wilt, Reuben A., ..... Ligonier, ..... Westmoreland county.  
 Wiltberger, David S., ..... 233 North Second street, .. Philadelphia.  
 Wiltberger, David S. Jr., ..... 233 North Second street, .. Philadelphia.  
 Winebrenner, Geo. B., .... 8th and Wharton St., .... Philadelphia.  
 Wineman, Elmer E., ..... Homer City, ..... Indiana county.  
 Winfield, Wm. H., ..... California, ..... Washington county.  
 Winger, David Z., ..... Mercersburg, ..... Franklin county.  
 Winger, Franklin, ..... Ephrata, ..... Lancaster county.  
 Winger, Henry C., ..... 421 State street, ..... Harrisburg.  
 Wingert, A. L., ..... Ridge and Girard avenue, Philadelphia.  
 Winnett, F. B., ..... Washington, ..... Washington county.  
 Winslow, C. S., ..... Punxsutawney, ..... Jefferson county.  
 Wirsing, T. Ray, ..... 615 Main street, ..... Sharpsburg.  
 Wise, Frank B., ..... Jefferson, ..... Greene county.  
 Wishart, Fred. G., ..... 2038 North Carlise street, .. Philadelphia.  
 Wishart, John E., ..... 124 W. Thompson St., .... Philadelphia.  
 Wissmann, Herman B., .... 1324 Cherry street, ..... Philadelphia.  
 Whissler, Arthur J., ..... 1403 Filbert street, ..... Philadelphia.  
 Whissler, Benj. A., ..... 111 Jefferson street, ..... Germantown.  
 Withrow, John H., ..... Chestnut Hill, ..... Philadelphia.  
 Withers, M. A., ..... Pottstown, ..... Montgomery county.  
 Witmer, David L., ..... 5th and Germantown, .. Philadelphia.  
 Witmer, E. H., ..... Neffsville, ..... Lancaster county.  
 Witmer, Horace F., ..... 5th and Germantown Ave., Philadelphia.  
 Witmer, Isaac M., ..... Conestoga, ..... Lancaster county.  
 Witmer, W. Scott, ..... 2101 Centre avenue, ..... Pittsburg.  
 Wittel, John K., ..... 7th and Morris Sts., .... Philadelphia.  
 Wittiger, Hugo O., ..... 31 Mehl street, ..... Germantown.  
 Wohlgenuth, Julius, .... 325 N. 17th St., ..... Philadelphia.  
 Woelzlager, John A., ..... Patton, ..... Cambria county.  
 Wolf, A. Curtin, ..... Rainsburg, ..... Bedford county.  
 Wolf, Chas. S., ..... East Berlin, ..... Adams county.  
 Wolf, Francis X., ..... 343 South Sixth street, .... Reading.  
 Wolf, Fred'k C., ..... East Berlin, ..... Adams county.  
 Wolf, Samuel S., ..... Shippensburg, ..... Cumberland county.  
 Wolfe, C. J., ..... 202 Market street, ... Lewisburg.  
 Wolfe, Nathaniel, ..... 17th and Reed Sts., .... Philadelphia.  
 Wolfender, Benj. F., ..... Ninth and Lombard Sts., .. Philadelphia.  
 Wolfersberger, Geo. W., .. Campbells, ..... Lebanon county.  
 Wolfson, Dr. Julius, .... 1001 South Sixth street, .. Philadelphia.  
 Woltman, Enos F., ..... 1600 North Eighth street, .. Philadelphia.  
 Wood, Edward V., ..... McKeesrocks, ..... Allegheny county.  
 Wood, Emerson J., ..... 113 Federal street, ..... Allegheny.  
 Wood, Franklin D., ..... Bradford, ..... McKean county.  
 Wood, George D., ..... Muncy, ..... Lycoming county.  
 Wood, George Y., ..... 941 Spruce street, ..... Philadelphia.  
 Woods, Chas. G., ..... Sewickley, ..... Allegheny county.

Woods, Samuel R.,	1100 Pine street,	Philadelphia.
Woods, Charles,	Danville,	Montour county.
Woodruff, John S.,	Roxboro,	Philadelphia.
Woodward, Albert B.,	Tunkhannock,	Wyoming county.
Woolcock, Thos.,	Shamokin,	Northumberland county.
Woolridge, David R.,	Woodland,	Clearfield county.
Work, Isaac S.,	New Florence,	Westmoreland county.
Worrall, Harry,	Birdsboro,	Westmoreland county.
Wray, Frank T.,	Apollo,	Armstrong county.
Wray, Wm. S.,	Apollo,	Armstrong county.
Wright, Geo. S. R.,	4401 Frankford avenue,	Philadelphia.
Wright, James E.,	303 Mill street,	Bristol.
Wrigley, John T.,	1801 Orthodox street,	Philadelphia.
Wuller, D. H.,	Butler,	Butler county.
Wuller, Joseph L.,	Butler,	Butler county.
Wurzel, Henry,	5019 Dearborn street,	Pittsburg.
Wurzel, John,	4116 Penn avenue,	Pittsburg.
Yanney, James,	Sandy Lake,	Mercer county.
Yarnall, Albin P.,	Ashbourne,	Montgomery county.
Yarnall, Benj. D.,	Ashbourne,	Montgomery county.
Yates, Thos. J.,	37 Butler street,	Pittston.
Yates, Wm. M.,	Meadville,	Crawford county.
Yeagle, Atwood,	600 DeKalb street,	Norristown.
Yeagle, Samuel N.,	418 W. Marshall St.,	Norristown.
Yeagly James F.,	9th and Filbert Sts.,	Philadelphia.
Yellig, Daniel C.,	Western and Grant Aves.,	Allegheny.
Yerkes, Chas. M.,	1939 Warnock street,	Philadelphia.
Yost, Geoffrey P.,	York,	York county.
Yost, Geo. P.,	Glen Rock,	York county.
Yost, J. Miles,	Williamsport,	Lycoming county.
Yost, Wm. O.,	4779 Germantown avenue,	Philadelphia.
Young, Benj. F.,	209 Main street,	Coatesville.
Young, Calvin K.,	Lykens,	Dauphin county.
Young, Chas.,	205 Franklin street,	Johnstown.
Young, Chas. L.,	Terrace and Hermit sts.,	Philadelphia.
Young, E. B.,	Monroeton,	Bradford county.
Young, Geo. E.,	1335 Parrish street,	Philadelphia.
Young, John H.,	Beaver Falls,	Beaver county.
Young, John K.,	Bristol,	Bucks county.
Young, John L. B.,	1826 Montgomery avenue,	Philadelphia.
Young, P. R. J.,	4060 Chestnut street,	Philadelphia.
Young, Richard B.,	Millersburg,	Dauphin county.
Young, Robert T.,	1600 Chestnut street,	Philadelphia.
Young, Robert W.,	Slatington,	Lehigh county.
Young, Samuel P.,	1106 Chestnut street,	Philadelphia.
Young, Warren Ray,	2758 N. 15th street,	Philadelphia.
Young, William Grant,	419 Larimer avenue,	Pittsburg.
Young, Wm. S.,	Coatesville,	Chester county.
Zacharial, Gustav H.,	Sharpsburg,	Allegheny county.
Zacherle, Otto F.,	3012 Stiles street,	Philadelphia.
Zeamer, Harry W.,	240 Locust street,	Columbia.
Zeller, J. Paul,	13th and Jefferson streets,	Philadelphia.
Zeller, Wm. S.,	Bellefonte,	Centre county.

Zerr, Samuel N.,	243 Reed street,	Reading.
Zeigler, Albert L.,	York,	York county.
Zeigler, Andrew W.,	2631 Carson street,	Philadelphia.
Zeigler, Harry,	226 Allegheny avenue,	Allegheny.
Zeigler, Howard P.,	524 Franklin street,	Reading.
Zeigler, Philip M.,	526 Penn street,	Reading.
Zeigler, R. Wm.,	400 West Market street,	York.
Zeigler, Wm. H.,	3028 Frankford avenue,	Philadelphia.
Zeigler, Wm. L.,	Steelton,	Dauphin county.
Zimmerman, H. M.,	Mt. Carmel,	Northumberland county.
Zimmerman, Wm. J.,	New Salem,	Westmoreland county.
Zinck, Chas. M.,	Erle,	Erle county.
Zoeller, Joseph P.,	112 S. 19th street,	Pittsburg.
Zoellner, Oscar H.,	2d and Green streets,	Philadelphia.
Zook, John N.,	Coatesville,	Chester county.
Zullinger, Aaron H.,	1410 Chestnut street,	Philadelphia.

### Qualified Assistants.

Adkins, Samuel B.,	Shickshinny,	Luzerne county.
Aiken, Albert I.,	63 Irwin avenue,	Allegheny.
Aiken, Clara,	Berwyn,	Chester county.
Ainsworth, Mrs. H.,	Boston,	Allegheny county.
Albaugh, Herbert S.,	2200 N. 15th street,	Philadelphia.
Albin, Samuel M.,	6130 Penn avenue,	Pittsburg.
Alexander, Chas. E.,	112 North Duke street,	York.
Alexander, Wm. A.,	Chester,	Delaware county.
Allen, Chas. B.,	York,	York county.
Allen, Edward,	2321 Pennsylvania ave.,	Pittsburg.
Allison, Wm. L.,	Waynesburg,	Greene county.
Altenburger, Ulrich,	80 Maple avenue,	Pittsburg.
Althouse, Henry B.,	936 N. 42d street,	Philadelphia.
Amick, Ira P.,	2059 N. 13th street,	Philadelphia.
Anderson, C. G.,	804 Main street,	Braddock.
Anderson, Geo. C.,	Meadville,	Crawford county.
Anderson, John H.,	3d and George streets,	Philadelphia.
Anderson, John S.,	Braddock,	Allegheny county.
Andrews, Wm. K.,	Mill Village,	Erle county.
Anewalt, E. Q.,	Madera,	Clearfield county.
Anthony, Wm. R.,	Glen Lyon,	Luzerne county.
Appel, Albert A.,	229 N. 22d street,	Philadelphia.
Apple, Samuel J.,	Indiana,	Indiana county.
Arcularius, Harry E.,	330 W. Indiana avenue,	Philadelphia.
Armitage, John S.,	1506 Diamond street,	Philadelphia.
Armstrong, Lloyd F.,	Grove City,	Mercer county.
Arndt, Harry, Jr.,	1704 N. 25th street,	Philadelphia.
Ashe, Henry P.,	1304 Colwell street,	Pittsburg.
Azsmann, Louise H.,	44th and Market streets,	Philadelphia.
Auker, Edgar T.,	Mifflintown,	Juniata county.
Bacon, Edwin G.,	Freehold,	New Jersey.
Baer, H. L.,	1202 Race street,	Philadelphia.
Baer, L. Miles,	501 S. 24th street,	Philadelphia.
Bailey, Fred. M.,	1402 Lexington avenue,	New York City.
Baker, Chas. R.,	Greensburg,	Westmoreland county.

Baker, Geo. L.,	3100 N. 16th street,	Philadelphia.
Baker, Newton C.,	1403 Filbert street,	Philadelphia.
Bamford, M. W.,	320 North Ninth street,	Reading.
Barber, Blakely H.,	West Pittson,	Luzerne county.
Barber, Geo. R.,	1206 Thompson street,	Scranton.
Barnard, Henry S.,	Ashland,	Schuylkill county.
Barnes, Harry W.,	Chester,	Delaware county.
Barnett, E. E.,	742 N. 38th street,	Philadelphia.
Barnett, Wm. O.,	Montrose,	Susquehanna county.
Barnhart, S. W.,	Oil City,	Venango county.
Barns, Leslie E.,	Camptown,	Bradford county.
Barr, Robert H.,	2329 N. 19th street,	Philadelphia.
Barr, Wm. D.,	McKeesrocks,	Allegheny county.
Bartholomew C. L.,	430 Franklin street,	Philadelphia.
Bartlett, Miss H. Francis,	1429 Chestnut street,	Philadelphia.
Bates, John P.,	Mansfield,	Tioga county.
Bauer, Louis D.,	635 N. 5th street,	Philadelphia.
Baumeister, Wm.,	519 Lackawanna avenue,	Scranton.
Bayard, Geo. D.,	Bellefonte,	Centre county.
Beane, Geo. R.,	600 N. 11th street,	Philadelphia.
Beaver, Frank W.,	308 S. Hyde Park avenue,	Scranton.
Beckett, Joseph B.,	Woodbury,	New Jersey.
Feeler, Aaron W.,	1035 Vine street,	Philadelphia.
Beh, Edward,	4th and Wolf streets,	Philadelphia.
Benford, Geo. W., Jr.,	Somerset,	Somerset county.
Bender, Fannie C.,	Jonestown,	Lebanon county.
Bennett, Daniel M.,	63 Federal street,	Allegheny.
Berry, Robert T.,	1133 South Broad street,	Philadelphia.
Beyerle, Chas. W.,	933 Fairmount avenue,	Philadelphia.
Bierman, Valentine,	1213 S. 49th street,	Philadelphia.
Billhartz, W. Harry,	2176 Wylie avenue,	Pittsburg.
Bimber, Carl,	2513 Carson street,	Pittsburg.
Binkley, Harry J.,	4th and Syruce streets,	Reading.
Binns, Harry R.,	77 West Johnson street,	Germantown.
Birch, Samuel B.,	Greensboro	Greene county.
Blitner, Winfield S.,	723 Berks street,	Philadelphia.
Black, Caroline C.,	Coultersville,	Allegheny county.
Black, Robert M.,	758 Martin street,	Philadelphia.
Blair, Geo. T.,	1436 Lombard street,	Philadelphia.
Blatchley, Harry L.,	Wellsboro,	Tioga county.
Blecher, Isaac B.,	Third and South streets,	Philadelphia.
Blew, Curtis E.,	353 Beaver avenue,	Allegheny.
Blithe, Henry A.,	2212 Market street,	Philadelphia.
Blithe, Wesley L.,	2212 Market street,	Philadelphia.
Bloes, Joseph C.,	McKeesport,	Allegheny county.
Blummart, C. Albert,	2030 Westmoreland street,	Philadelphia.
Boggs, Alex. W.,	34 Ohio street,	Allegheny.
Bohnen, Wm. L.,	6000 Penn avenue,	Pittsburg.
Bolton, Alfred H., Jr.,	Chew and Chelton avenue,	Germantown.
Bolton, Joseph P.,	124 North Penn street,	Germantown.
Boorse, Henry A.,	1340 DeKalb street,	Norristown.
Boose, Wm. E.,	439 W. King street,	York.
Booth, Harry E.,	709 W. Cumberland street,	Philadelphia.

Booth, Jas. L.,	2013 South Fourth street,	Philadelphia.
Bordner, Wm. H.,	Kensington,	Philadelphia.
Bosan, Chas. J.,	Grandview ave. & Oneida,	Pittsburg.
Boss, Wm. H.,	Townville,	Crawford county.
Bostock, Herbert A.,	403 Tremont avenue,	Norristown.
Bott, Joseph H.,	615 Dickson street,	Homestead.
Bouse, Harry I.,	Milesburg,	Centre county.
Bower, Robert H.,	Arnot,	Tioga county.
Bowers, Charley A.,	Prospect,	Butler county.
Boyd, Geo. S.,	Union City,	Erie county.
Boyer, Allen W.,	1136 Hamilton street,	Allentown.
Bradley, Wm. N.,	1155 South Eighth street,	Philadelphia.
Brady, Geo. H.,	Washington,	Washington county.
Brallier Josiah Y.,	Somerset,	Somerset county.
Breidinger, L. A.,	501 S. 24th street,	Philadelphia.
Breithaupt, A. P.,	2226 Howard street,	Philadelphia.
Bremer, Albert H.,	337 S. 12th street,	Philadelphia.
Brendel, Fred. C.,	4434 Lancaster avenue,	Philadelphia.
Brennan, Thos. F.,	1201 Spruce street,	Philadelphia.
Bresser, Otto C.,	401 Hickory street,	Scranton.
Bricker, Joseph M.,	Somerset,	Somerset county.
Briggs, Forrest W.,	Shickshinny,	Luzerne county.
Brock, Grant W.,	Meadville,	Crawford county.
Brooks, J., Warren,	Haddenfield,	New Jersey.
Brown, Howard A.,	319 South Craig street,	Pittsburg.
Brown, Wilbur B.,	Phillipsburg,	Centre county.
Browning, John W.,	1619 Wylie avenue,	Pittsburg.
Brugler, Elmer G.,	1201 Spruce street,	Philadelphia.
Brunier, Geo. F.,	2366 East York street,	Philadelphia.
Bryner, Geo. W.,	Connellsville,	Fayette county.
Buckhart, Franklin,	747 Marietta avenue,	Lancaster.
Buckingham, H. S.,	1435 N. 18th street,	Philadelphia.
Buehlre, D. A.,	1711 Summer street,	Philadelphia.
Burgery, John E.,	289 Beaver avenue,	Allegheny.
Burcaw, Fred. C.,	230 Terrace avenue,	West Bethlehem.
Burchfield, Wm. S.,	213 Fish street,	Pittsburg.
Burford, Ethan A.,	106 Burtan avenue,	Washington.
Burke, Sylvester L.,	Lowellville,	Ohio.
Burt, Normann,	Frankford,	Philadelphia.
Buss, Marcus,	South Bethlehem,	Northampton county.
Cain, Benj. F.,	Berwick,	Columbia county.
Cain, Maude F.,	431 West Orange street,	Lancaster county.
Calhoun, Wm. M.,	Verona,	Allegheny county.
Cameron, Chas. S.,	1848 S. 16th street,	Philadelphia.
Campbell, Chas. C.,	45 Anderson street,	Allegheny.
Campbell, Clarence H.,	1800 Market street,	Philadelphia.
Campbell, Emerson,	2542 Richmond street,	Philadelphia.
Campbell, Wm. A.,	Fredonia,	Mercer county.
Campbell, Wm. L.,	12th and Market streets,	Philadelphia.
Carmann, Harry A.,	1504 Oak Dale street,	Philadelphia.
Carpenter, E. A.,	143 N. 11th street,	Philadelphia.
Carrier, Ira,	Punxsutawney,	Jefferson county.
Cartens, Louis P.,	717 N. 11th street,	Philadelphia.

Carfter, Chas. F.,	145 North Tenth street,	Philadelphia.
Cassel, James W.,	1645 North Broad street,	Philadelphia.
Cassel, Oscar H.,	Norristown,	Montgomery county.
Cassidy, John F.,	Second and Green streets,	Philadelphia.
Cavanaugh, Chas. J.,	3017 Frankford avenue,	Philadelphia.
Chalfant, Chas. J.,	1800 East Passyunk ave.,	Philadelphia.
Chalfant, Wm. W.,	1440 S. 20th street,	Philadelphia.
Cherdron, Chas.,	170 East street,	Allegheny.
Christ, Frank,	2809 Warnock street,	Philadelphia.
Christman, Albert S.,	Bethlehem,	Northampton county.
Civins, Albert I.,	108 Public Square,	Wilkes-Barre.
Clapp, Samuel C., Jr.,	2201 North Fifth street,	Philadelphia.
Clark, Edward B.,	343 South Sixth street,	Reading.
Clewell, Lawrence J.,	126 West Front street,	Berwick.
Cline, Wm. E.,	2301 Christian street,	Philadelphia.
Cloud, Norman H.,	100 W. Susquehanna ave.,	Philadelphia.
Cochran, Fred. A.,	514 South High street,	West Chester.
Cochran, John C.,	Big Run,	Jefferson county.
Codori, Simon J., Jr.,	Gettysburg,	Adams county.
Coffrey, John B.,	1200 Callowhill street,	Philadelphia.
Coffy, Maurice G.,	Lock Haven,	Clinon county.
Colbert, Walter E.,	Oil City,	Venango county.
Coldsmith, Chas. F.,	Mt. Pleasant,	Westmoreland county.
Cole, Percy L.,	Dunmore,	Lackawanna county.
Coleman, Chas. M.,	5812 Rural avenue,	Pittsburg.
Coleman, Edward W.,	Canonsburg,	Washington county.
Coleman, John E.,	Carbondale,	Lackawanna county.
Coller, Wm. W.,	845 North Sixth street,	Philadelphia.
Collins, Harry T.,	632 N. 18th street,	Philadelphia.
Collins, John H.,	208 Market street,	Philadelphia.
Comber, Daniel J.,	2010 Sansom street,	Philadelphia.
Conklin, Claud E.,	603 Grays Ferry Road,	Philadelphia.
Conley, Frank H.,	Shamokin,	Northumberland county.
Cook, Wm. S. G.,	Coatesville,	Chester county.
Cooke, W. Miller,	353 Beaver avenue,	Allegheny.
Coon, Maurice J.,	Plymouth,	Luzerne county.
Cooper, Frank A.,	Parnassus,	Westmoreland county.
Cooper, Morris,	Second and York streets,	Camden, N. J.
Cope, Edward K.,	424 North Dauphin street,	Philadelphia.
Copeland, Harry F.,	Greensburg,	Westmoreland county.
Copland, Maud P.,	Myersdale,	Somerset county.
Cordes, Frank,	6906 Hamilton avenue,	Pittsburg.
Cormeny, Frank H.,	532 South Queen street,	Lancaster.
Cornfield, Abraham,	809 South Second street,	Philadelphia.
Cornfield, Kittle B.,	Corydon,	Warren county.
Cornogg, Samuel S.,	Concordville,	Delaware county.
Corrie, Emma,	11th and McKean streets,	Philadelphia.
Costen, Wm. Adams,	1634 Columbia avenue,	Philadelphia.
Costin, John R.,	937 Spruce street,	Philadelphia.
Covett, Silas W.,	Wilkinsburg,	Allegheny county.
Cox, Harriett F.,	4234 Germantown avenue,	Philadelphia.
Cox, Linwood,	Norristown,	Montgomery county.
Craig, Bertram J.,	1216 Chestnut street,	Philadelphia.



Craig, Harry F.,	St. Petersburg,	Clarion county.
Craig, James,	2935 Almendo street,	Philadelphia.
Craig, Ralph B.,	315 North Seventh street,	Philadelphia.
Craig, Tom. B.,	Freedom,	Beaver county.
Crawford, W. B.,	Main and Queen,	Chambersburg.
Criswell, Edward O.,	3401 Wharton street,	Philadelphia.
Crittenden, S. W.,	Oswago,	Potter county.
Croft, Wm. K.,	239 S. 11th street,	Philadelphia.
Croushore, Henry G.,	Grapeville,	Westmoreland county.
Cunningham, Wm. J.,	1410 Seventh avenue,	Beaver Falls.
Cyphers, Frank R.,	Turtle Creek,	Allegheny county.
Daly, James J.,	1010 Callowhill street,	Philadelphia.
Jaunenbauer, Fred'k,	1301 Germantown avenue,	Philadelphia.
Davies, Wm. R.,	145 North Tenth street,	Philadelphia.
Davis, Guyon I.,	Hollidaysburg,	Blair county.
Davis, Ira W.,	Ebensburg,	Cambria county.
Davis, James F.,	634 Preble avenue,	Allegheny.
Davis, Jacob B.,	York,	York county.
Davis, John E.,	Frankford,	Philadelphia.
Davis, Lewis E.,	Centralla,	Columbia county.
Davis, L. F.,	Mt. Union,	Huntingdon county.
Davis, Thos. T.,	383 East Market street,	Wilkes-Barre.
Davis, Wm. D.,	Lansford,	Carbon county.
Davis, Wm. N.,	Summit Hill,	Carbon county.
Deardorff, Calvin A.,	2445 Ridge avenue,	Philadelphia.
Decker, W. Robert,	2239 Fairmount avenue,	Philadelphia.
Deegan, S. S.,	211 East Coal street,	Shenandoah.
Deemer, G. M. Hays,	1737 Columbia avenue,	Philadelphia.
DeGraffe, Bertha L.,	1330 Arch street,	Philadelphia.
Delbert, Wm. H.,	Seventh and Oxford sts.,	Philadelphia.
Delfin, Frank,	58 Shiloh street,	Pittsburg.
Dennes, Elmer S.,	146 North Queen street,	Lancaster.
DeNormandie, F. R.,	Washington,	Washington county.
Derr, Wm. G.,	New Castle,	Lawrence county.
Devine, Oliver C.,	1320 S. 18th street,	Philadelphia.
Dillon, Robert,	Carapopolis,	Allegheny county.
Dimon, Chas. A.,	1029 Walnut street,	Philadelphia.
Dirmitt, Jennie,	1201 S. 19th street,	Philadelphia.
Dix, Carron, E.,	155 Lincoln avenue,	Carbondale.
Doersam, Philip, Jr.,	650 Adams avenue,	Scranton.
Donahue, John L.,	Bloomsburg,	Columbia county.
Donaidson, Frank P.,	Canonsburg,	Washington county.
Donnelly, Clarence E.,	2134 Vine street,	Philadelphia.
Donovan, John B.,	Laceyville,	Wyoming county.
Dorwart, Wm. E.,	442 Concord street,	Lancaster.
Dostrow, Alexander,	768 South Third street,	Philadelphia.
Doughetry, Albert,	407 Delaware avenue,	Wilmington, Del.
Douglas, James C.,	Latrobe,	Westmoreland county.
Drake, John W.,	Cambridgeboro,	Crawford county.
Dreiffoos, Benj. F.,	707 Penn street,	Reading.
Duer, Milton A.,	Munhall,	Allegheny county.
Duncan, Frederick,	Oil City,	Venango county.
Dunlavy, M. J.,	Sligo,	Clarion county.

Dunn, Edward A.,	225 Poplar street,	Philadelphia.
Dunning, Geo. A.,	155 Main street,	Honesdale.
Dunning, John,	16 Wabash avenue,	Pittsburg.
Dunwiddie, Wm. A.,	Philipsburg,	Centre county.
Durham, John Mc.,	18 South Fifth street,	Reading.
Eason, David C.,	Greenville,	Mercer county.
Eberle, John,	Erie,	Erie county.
Eby, Benjamin S.,	Newport,	Perry county.
Eckels, Frank H.,	600 South Broad street,	Philadelphia.
Eggers, Howard C.,	172 Ohio street,	Allegheny
Elhman, Joseph W.,	706 Packer street,	Williamsport.
Elfreth, G. A.,	400 Queen street,	Philadelphia.
Elliott, Boyce,	1110 Spring Garden street,	Philadelphia.
Elliott, James B.,	Metal,	Franklin county.
Elliott, James T.,	23 East Middle street,	Gettysburg
Ellspermann, Chas. W.,	1819 South Eighth street,	Philadelphia.
Elrick, Richard E.,	Harrisville,	Butler county.
Ely, Benj. C.,	Girard,	Erie county.
Ely, Mrs. K. R.,	Newport,	Perry county.
Ely, Wm. Castor,	1900 Green street,	Philadelphia.
Emery, David H.,	Corry,	Erie county.
Emery, Ernest H.,	Greenville,	Mercer county.
Emery, Robert G.,	Grove City,	Mercer county.
Engel, Wm. C.,	Meadville,	Crawford county.
Ensign, Edward O.,	Waymart,	Wayne county.
Ensminger, S. C. D.,	Manheim,	Lancaster county.
Erskine, Wm. S.,	28 Anderson street,	Philadelphia.
Eschbach, Clarence D.,	Greenville,	Mercer county.
Essick, Clara B.,	Picture Rocks,	Lycoming county.
Evans, Abner T.,	342 South Fifth street,	Philadelphia.
Evans, Edward E.,	205 Lacock street,	Allegheny
Evans, John C.,	Scottdale,	Westmoreland county.
Everett, D. F.,	Connellsville,	Fayette county.
Eyre, Wm. H.,	Third and Kerlin streets,	Chester.
Fagley, Roscoe C.,	Mt. Carmel	Northumberland county.
Fagnan, Geo. C.,	117 Main street,	Bradford.
Faries, Joseph B.,	2400 N. 15th street,	Philadelphia.
Farrell, Martin E.,	529 Kohn street,	Norristown.
Farrow, Charlie T.,	1300 South Fifth street,	Philadelphia.
Felker, Harry,	Preston and Brown sta.,	Philadelphia.
Fetter, Thos. S.,	Shippensburg,	Cumberland county.
Few, Colin, S.,	12th and Rice streets,	Philadelphia.
Flery, Max J.,	Hagerstown,	Maryland.
Filler, Burritt B.,	625 South 16th street,	Philadelphia.
Finger, Philip C.,	Duke and Lemon streets,	Lancaster.
Fischer, Fredk. F.,	2332 Frankford avenue,	Philadelphia.
Fischler, Ernest M.,	Gaines,	Tioga county.
Fishburne, R. L.,	315 East Main street,	Lock Haven.
Fisher, Chas. M.,	194 Federal street,	Allegheny
Fisher, Samuel K.,	Broad St. Sta., Pharmacy,	Philadelphia.
Fister, Chas. W.,	Sunbury,	Northumberland county.
Fithian, Margaret J.,	Grove City,	Mercer county.
Fitzgerald, W. S.,	2010 North Eighth street,	Philadelphia.

Flecher, Geo., ..... Fryburg, ..... Clarion county.  
 Fleming, James R., ..... Forest City, ..... Susquehanna county.  
 Fleming, John H., ..... Media, ..... Delaware county.  
 Fletcher, Geo. M., ..... Erie, ..... Erie county.  
 Fluck, Frank W., ..... 15th and Master streets, ... Philadelphia.  
 Fluss, Julius, ..... 216 Franklin street, ..... Philadelphia.  
 Foote, John A., ..... Archbald, ..... Lackawanna county.  
 Foote, Sara J., ..... Canonsburg, ..... Washington county.  
 Ford, Michael, ..... 144 South Main street, ... Pittston.  
 Forsythe, Bert. S., ..... Dawson, ..... Fayette county.  
 Forthman, James M., ..... Waynesboro, ..... Franklin county.  
 Foster, Joseph S., ..... Petrolia, ..... Butler county.  
 Foster, Wm. N., ..... 2652 Ann street, ..... Philadelphia.  
 Foucar, Chas. R., ..... Oil City, ..... Venango county.  
 Francke, Edward O., ..... Towanda, ..... Bradford county.  
 Frank, Harrison E., ..... 631 Race street, ..... Harrisburg.  
 Frank, Louis, ..... Wilkes-Barre, ..... Luzerne county.  
 Frantz, Wm. H., ..... Duquesne, ..... Allegheny county.  
 Freeman, John W., ..... Derry, ..... Westmoreland county.  
 French, Edwin A., ..... New Milford, ..... Susquehanna county.  
 Frey, John J., ..... Frostburg, ..... Maryland.  
 Friebele, Harry E., ..... 46th and Baltimore ave., ... Philadelphia.  
 Fueller, Howard, ..... 422 Market street, ..... McKeesport.  
 Funk, Robert R., ..... 11th and Oxford streets, .. Philadelphia.  
 Furman, Edward F., ..... Shenandoah, ..... Schuylkill county.  
 Gable, Fred. B., ..... 2450 Wylie avenue, ..... Pittsburg.  
 Gabler, Theo. J., ..... 4320 Main street, ..... Manayunk.  
 Gabriel, Mrs. Alice G., ..... Spartansburg, ..... Crawford county.  
 Gaertner, Darwin, R., ..... 767 South Ninth street, ... Philadelphia.  
 Galer, Frank A., ..... 13th and Lombard streets, Philadelphia.  
 Garber, Frank, ..... Greenville, ..... Mercer county.  
 Gardner, Robert J., ..... 2041 Pine street, ..... Philadelphia.  
 Geasey, Geo. W., ..... 1306 Girard avenue, ..... Philadelphia.  
 Geiger, Walter S., ..... 852 Penn street, ..... Reading.  
 George, Alfred, ..... Hanover, ..... York county.  
 Geriack, Herman, ..... 10th and Ogden streets, ... Philadelphia.  
 German, Elias, ..... Slatington, ..... Lehigh county.  
 Gerry, Ella M., ..... Coopersburg, ..... Lehigh county.  
 Gessford, Otice E., ..... 44th and Lancaster ave., Philadelphia.  
 Geuther, Fredk. E., ..... 2441 North Second street, Philadelphia.  
 Gillespie, Chas. D., ..... 96 Diamond street, ..... Pittsburg.  
 Gillespie, Frank, ..... Freeport, ..... Armstrong county.  
 Gillespie, Martin S., ..... Edinboro, ..... Erie county.  
 Gillespie, Wm. A., ..... 1836 Tasker street, ..... Philadelphia.  
 Gillette, Lester C., ..... 325 Main street, ..... Towanda.  
 Gillis, Claude B., ..... Kane, ..... McKean county.  
 Glover, Oliver W. H., ..... Laurelton, ..... Union county.  
 Goldsmith, Lee, ..... 2649 Marshall street, ..... Philadelphia.  
 Good, James, R., ..... Mercer, ..... Mercer county.  
 Good, Robert F., ..... 3348 Market street, ..... Philadelphia.  
 Gooder, Albert, ..... Brookville, ..... Jefferson county.  
 Gorrey, Thos. F., Jr., ..... 131 N. 11th street, ..... Philadelphia.  
 Grady, Wm. P., ..... Broad & Fairmount ave., Philadelphia.  
 Graham, Frank R., ..... 177 Second avenue, ..... Pittsburg.

Graham, Harry E., .....Ninth and Vine streets,..Philadelphia.  
 Grakelow, Ralph, .....2458 N. 16th street, .....Philadelphia.  
 Green, Howard M., .....721 Centre street, .....Williamsport.  
 Greenawald, Mrs. B. S., ...7 East Market street, ....Pottsville.  
 Gressley, Wm. R., .....30 North Beaver street. ..York.  
 Greisemer, James A., ....Sixth and Race streets, ..Philadelphia.  
 Griffith, Oliver B., .....Armat and Willow ave.,..Germanstown.  
 Groblewski, Albert G., ..Plymouth, .....Luzerne county.  
 Groff, Harry M., .....1700 Mt. Vernon street, ..Philadelphia.  
 Grohmann, E. J. C., .....Butler, .....Butler coun y.  
 Gross, Ernest A., .....Wyoming, .....Luzerne county.  
 Gross, Paul H., .....York, .....York county.  
 Grover, Mary L., .....Luzerne, .....Luzerne county.  
 Grubb, Geo. H., .....2620 Colorado street, .....Philadelphia.  
 Grumer, Robert, .....Easton, .....Northampton county.  
 Grunden, P. E., .....363 South Second street, ..Steelton.  
 Hackenberger, Iva N., ...Bainbridge, .....Lancaster county.  
 Haeberle, Louis P., .....919 N. 26th street, .....Philadelphia.  
 Hahn, Chas., .....1440 S. 20th street, .....Philadelphia.  
 Haines, J. A., .....Brookville, .....Jefferson county.  
 Hall, Chas. A., .....925 North Broad street, ..Philadelphia.  
 Hall, Chas. B., .....630 State street, .....Erie.  
 Hall, John W., Jr., .....807 Hepburn street, .....Williamsport.  
 Hall, Robert C., .....1403 Filbert street, .....Philadelphia.  
 Hamilton, Wm. H., .....1747 N. 17th street, .....Philadelphia.  
 Hanna, Frank H., .....Springdale, .....Allegheny county.  
 Hannan, Frank W., .....10th and Spruce streets, ..Philadelphia.  
 Harbach, Edward J., ...344 North Sixth street, ..Reading.  
 Hardy, Irwin, .....Dunbar, .....Fayette county.  
 Harding, Chas. L., .....Waverly, .....Tioga county.  
 Harmon, Geo. A., .....243 South Tenth street, ..Philadelphia.  
 Harner, Russell, S., .....17th and South street, ...Philadelphia.  
 Harper, A. R. H., .....64 Wabash street, .....Pittsburg.  
 Harrell, Herbert D., .....928 South Ninth street. ..Philadelphia.  
 Harrington, E. J., .....925 Carson street, .....Pittsburg.  
 Harrington, D. C., .....Wellsboro, .....Tioga county.  
 Harris, Clarence M., .....1641 Franklin street, .....Philadelphia.  
 Harrold, Wm H., .....8th and Cumberland sts.,..Philadelphia.  
 Harry, H. Maxwell, .....Conshohocken, .....Montgomery county.  
 Hart, DeForest, .....Bradford, .....McKean county.  
 Hart, Edward A., .....1814 Perklonsen street, ...Reading.  
 Harter, Chas. W., .....Taylor, .....Lackawanna county.  
 Hartleb, Fritz, .....1374 Second avenue, .....Pittsburg.  
 Hartman, Henry L., .....403 Tenth street, .....Lebanon.  
 Hauck, Clarence A., .....Ellwood City, .....Lawrence county.  
 Hauck, John A., .....52 N. 36th street, .....Philadelphia.  
 Haus, Ralph L., .....Bridesburg, .....Philadelphia.  
 Haymaker, Milo M., .....667 N. 13th street, .....Philadelphia.  
 Hayman, Walter, .....Turbotville, .....Northumberland county.  
 Head, Ray C., .....Latrobe, .....Westmoreland county.  
 Hecker, Virginia, .....932 N. 30th street, .....Philadelphia.  
 Heckerman, Adam B., ....Bedford, .....Bedford county.  
 Heckman, Harvey V., ....80 Washington street, ....Pittsburg.  
 Hefferman, Joseph A., ....131 East Market street, ..Wilkes-Barre.

Heffner, Edgar F.,	Glen Riddle,	Delaware county.
Heidenreich, Wm. F.,	3610 Fifth avenue,	Pittsburg.
Helm, Christian, Jr.,	898 N. 44th street,	Philadelphia.
Heinbach, Frank W.,	St. Clair,	Schuylkill county.
Heisler, M. Luther,	1211 Kittatinny street,	Harrisburg.
Helfrich, Edward D.,	237 North Tenth street,	Philadelphia.
Hellerbach, Peter, A.,	1251 Penn avenue,	Pittsburg.
Hellyer, Edwin F.,	2017 Franklin street,	Philadelphia.
Helm, Robert,	1614 North Second street,	Philadelphia.
Henderson, Walter,	1115 Seventh avenue,	Beaver Falls.
Hendrickson, Wm. R.,	1801 North Eighth street,	Philadelphia.
Henkel, Luther S.,	Frankford ave. & Hart L.,	Philadelphia.
Herold, Geo. W.,	417 Walnut street,	McKeesport.
Herr, Harry M.,	3334 East King street,	Lancaster.
Herrmann, Wm.,	203 West Market street,	Philadelphia.
Hertzler, John C.,	146 North Queen street,	Lancaster.
Herzog, Albert,	730 North 16th street,	Philadelphia.
Hetrick, Annie L.,	Wellsville,	York county.
Heverly, Fred. C.,	Camden,	New Jersey.
Heverly, James F.,	Howard,	Centre county.
Heymann, Alfred,	1204 South Eighth street,	Philadelphia.
Heyser, Jonas E.,	4254 Regent Square,	Philadelphia.
Hickman, H. G.,	334 East King street,	Lancaster.
Hickock, Geo. R.,	Troy,	Bradford county.
Hilfmeier, Wm. J.,	1130 South 12th street,	Philadelphia.
Hildebrand, W. M.,	Indiana,	Indiana county.
Hileman, Geo. F.,	Dallas,	Luzerne county.
Hill, Theo. T.,	4727 Liberty avenue,	Pittsburg.
Hinckel, G. Edward,	2137 North 18th street,	Philadelphia.
Hindman, Homer C.,	West Sunbury,	Butler county.
Hinterleiter, P. Leshner,	123 Ohio street,	Allegheny.
Hippler, Harry R.,	26 Meehan avenue,	Philadelphia.
Hodgson, Arthur R.,	Rochester,	Beaver county.
Hoechstetter, Hugo,	7 Lamont street,	Philadelphia.
Hoegel, Frank C.,	106 Fountain street,	Allegheny.
Hoelzle, Wm.,	37 Alma street,	Allegheny.
Hoffman, Ella S.,	Ninth and Liberty sts.,	Allentown.
Hoffman, Oscar P.,	437 Northampton street,	Easton.
Hoffman, Wm. A.,	Renovo,	Clinton county.
Hoffman, Wm. S.,	1427 E. Susquehanna ave.,	Philadelphia.
Hoft, Wm. I.,	807 Passyunk avenue,	Philadelphia.
Hoge, Geo. W.,	40 Sixth street,	Pittsburg.
Holbert, Robert S.,	575 West Chestnut street,	Washington.
Holler, Harry G.,	1158 North Third street,	Williamsport.
Holliday, John T.,	2314 S. 12th street,	Philadelphia.
Holljes, John L.,	332 S. Patterson Park ave.,	Baltimore, Md.
Hollopeter, Martha E.,	Shickshinny,	Luzerne county.
Hollowell, Bruce C.,	1511 Sellers street,	Frankford.
Holmes, Wm. D.,	Waterford,	Erie county.
Horst, Harry L.,	Lock Haven,	Clinton county.
Hoskins, John,	Elwyn,	Delaware county.
Hostetter, Harry J.,	1131 Franklin street,	Reading.
Howard, Horace E.,	20th and Spruce Sts.,	Philadelphia.
Howard, John E.,	4516 Lancaster avenue,	Philadelphia.

Howe, Herman N.,	7 Pennsylvania avenue,	.. Tyrone.
Hubley, Anna M.,	30 West King street,	.... Lancaster.
Hubley, John H. Jr.,	Latrobe,	..... Westmoreland county.
Humpton, Albert N.,	614 N. 33d St.,	..... Philadelphia.
Hunter, David C.,	3610 Fifth avenue,	..... Pittsburg.
Huntington, Joseph,	3312 Woodland avenue,	... Philadelphia.
Hursh, John S.,	Newville,	..... Cumberland county.
Hutton, Abner C.,	11th and South Sts.,	..... Philadelphia.
Hyde, John W. Jr.,	5713 Rural street,	..... Pittsburg.
Infield, James C.,	62 Federal street,	..... Allegheny.
Irvine, John, Jr.,	Carlisle,	..... Cumberland county.
Irwine, Geo. R.,	Clearfield,	..... Clearfield county.
Isenberg, Charles,	2024 North Seventh street,	Philadelphia.
Jacoby, Chas. N.,	667 North Second street,	.. Philadelphia.
Jacoby, Wm. L.,	1600 Pine street,	..... Philadelphia.
James, B. Frank,	Ebensburg,	..... Cambria county.
James, Robert R.,	135 N. 11th St.,	..... Philadelphia.
Janda, Thos. J.,	5 Main street,	..... Allegheny.
Jenckes, Sydney J.,	Montrose,	..... Susquehanna county.
Jenkins, David J.,	Scranton,	..... Lackawanna county.
Jester, Thos. E.,	West Elizabeth,	..... Allegheny county.
Johns, Albert S.,	75 Isabella street,	..... Allegheny.
Johns, Frank J.,	4th and Berks streets,	.. Philadelphia.
Johnson, C. G.,	624 N. 12 St.,	..... Philadelphia.
Johnson, Frank R.,	1300 North Third street,	.. Chester.
Johnson, Hussey B.,	116 South Third street,	... New Brighton.
Johnson, Oliver C.,	624 N. 12th St.,	..... Philadelphia.
Johnston, Edward J.,	Freedom,	..... Beaver county.
Johnston, James C.,	18 Arch street,	..... Allegheny.
Jones, Edward E.,	Harford,	..... Susquehanna county.
Jones, Geo. S.,	508 Wyoming avenue,	.... Scranton.
Jones, John R.,	Jermyn,	..... Lackawanna county.
Jordy, Louis,	119 W. Philadelphia St.,	.. York.
Kachline, Fred'k W.,	Fifth street,	..... Easton.
Kalbach, Chas. P.,	2963 North Sixth street,	.. Philadelphia.
Kalkman, Henry A.,	Honesdale,	..... Wayne county.
Kaufman, Reuben M.,	Chestnut Hill,	..... Philadelphia.
Kaye, Emma L.,	2541 Brown street,	..... Philadelphia.
Keagy, Edwin J.,	8th ave., and 7th st.,	.... Altoona.
Kearns, W.,	527 Reed street,	..... Philadelphia.
Keefer, Edwin A.,	1739 Summit street,	..... Scranton.
Keeler, Joseph C.,	1829 Fitzwater street,	.... Philadelphia.
Kelchner, Chas. E.,	3201 Powelton avenue,	.... Philadelphia.
Keller, Augustus H.,	2423 North Seventh street,	Philadelphia.
Keller, Robert J.,	1013 W. Huntingdon St.,	.. Philadelphia.
Kelly, Clara E.,	Pleasant Unity,	..... Westmoreland county.
Kelly, Francis P.,	2129 Lawrence street,	.... Philadelphia.
Kelly H. M.,	819 Penn avenue,	..... Pittsburg.
Fendall, Benj. F.,	Marionville,	..... Forest county.
Kennedy, Newton,	Chicora,	..... Butler county.
Kennihan, John W.,	50 North Main street,	.... Sharpsburg.
Kessler, Lawrence A.,	2317 Spring Garden st,	.. Philadelphia.
Kintzer, Harry A.,	2100 North Fifth street,	.. Philadelphia.
Klenk, Horace D.,	Mt. Carmel,	..... Northumberland county.

Kline, Frank, .....	331 North Sixth street, ..	Reading.
Kline, Harry H., .....	600 Centre street, .....	Reading.
Kilnefelter, Charles, .....	Factoryville, .....	Wyoming county.
Knapp, Hanford, .....	Equinonk, .....	Wayne county.
Knight, Walter K., .....	Wenonah, .....	New Jersey.
Kosh, Bertha, .....	62 Washington street, ....	Pittsburg.
Kramer, Geo. H., .....	2232 Howard street, ....	Philadelphia.
Krauser, James S., .....	Milton, .....	Northumberland county.
Krewson, Wm. E., Jr., ....	1836 Franklin street, ....	Philadelphia.
Krider, Richard C., .....	1406 S. 15th St., .....	Philadelphia.
Krumrine, Sidney, .....	202 N. 16th St., .....	Philadelphia.
Kuhn, John M., .....	Mercersburg, .....	Franklin county.
Kunkle, Timothy O., ....	15th and Master Sts., ....	Philadelphia.
Lackenmayer, H. J., ....	2618 Susquehanna avenue.	Philadelphia.
Lamb, Chas. F., .....	Shamokin, .....	Northumberland county.
Lambert, Herbert G., ....	800 Walnut street, .....	Philadelphia.
LaMaster H. G., .....	932 Marshall street, ....	Philadelphia.
Lampas, Harry G., .....	2433 N. 11th St., .....	Philadelphia.
Landis, Geo. S., .....	405 Market street, .....	Harrisburg
Lane, Samuel H., .....	528 Franklin street, ....	Philadelphia.
Langner Paul H., .....	533 Cedar street, .....	Reading.
Lanlus Ross M., .....	1010 Cherry street, .....	Philadelphia.
Lansaster, B. S., .....	640 N. 11th St., .....	Philadelphia.
Latchford, O. L., .....	4th and Berks Sts., .....	Philadelphia.
Laucks, Wm. Irwin, ....	116 Harter street, .....	Germantown,
Laughlin, Albert R., ....	2601 North Sixth street, ..	Philadelphia.
Lautenbacher, Wm. R., ..	2450 North Sixth street, ..	Philadelphia.
Lauterman, B. La Rue, ..	131 N. 11th St., .....	Philadelphia.
Lawton, Henry C., .....	146 N. 20th St., .....	Philadelphia.
Leaman, Davis H., .....	102 South Sixth street, ...	Reading.
Lebovitz, Emil, .....	Braddock, .....	Allegheny county.
Lecrone, Edward H., ....	2d and Hazlewood Ave., ..	Pittsburg.
Leech, David M., .....	3018 Wallace street, ....	Philadelphia.
Lefferts, Henry T., .....	Southampton, .....	Bucks county.
Lehman, Geo. T., .....	2967 Frankford avenue, ..	Philadelphia.
Lenhart, Enos S., .....	2154 N. 8th St., .....	Philadelphia.
LeSage, Geo. L., .....	1011 Fairmount avenue, ..	Philadelphia.
Leshner, Wm. R., .....	Nicetown, .....	Philadelphia.
Leslie, Harry C., .....	Susquehanna, .....	Susquehanna county.
Levan, Walter, .....	Gordon, .....	Schuylkill county.
Levergood, John, .....	Wrightsville, .....	York county.
Lewis, Daniel W., .....	501 East Girard avenue. ...	Philadelphia.
Lewis, Devoge E., .....	Charleroi, .....	Washington county.
Lewis, Griffith R., .....	Bradford, .....	McKean county.
Lewis, Howard H., .....	Bridesburg, .....	Philadelphia.
Light, James R., .....	1106 Girard street, ....	Philadelphia.
Limbirt, John B., L., ....	414 Penn avenue, .....	Pittsburg.
Lincoln, Geo. W., .....	1610 Master street, .....	Philadelphia.
Lindig, Chas. W., .....	Lewisburg, .....	Union county
Lindsey, John, .....	Washington and Wylie av.,	Pittsburg.
Lindsey, John K., .....	Mercer, .....	Mercer county.
Lindsey, Thos. S., .....	Mercer, .....	Mercer county.
Lindsman, F. M., .....	912 Water street, .....	Meadville.
Littlefield, B. A., .....	1011 Fairmount avenue, ...	Philadelphia.

Logan, Rollin M.,	Bellevue,	Allegheny county.
Lohman, John Jr.,	Edwardsdale,	Luzerne county.
Longmaker, Frank I.,	11 Smithfield street,	Pittsburg.
Longshaw, Thos. E.,	3907 Ridge avenue,	Roxborough.
Lorenz, Chas. G.,	4094 Lancaster avenue,	Philadelphia.
Loser, D. A.,	4th and Perry streets,	Columbia.
Loveland, R. W.,	20th and Cherry streets,	Philadelphia.
Lower, Geo. G.,	1027 Somerset street,	Philadelphia.
Luburg Leon F.	Seventh and Arch streets,	Philadelphia.
Luchsinger Samuel C.,	1800 N. 27th street,	Philadelphia.
Ludom, Morris,	1700 Wharton street,	Philadelphia.
Luebert, August G.,	2329 Sharswood street,	Philadelphia.
Lunny, John A.,	49 North Main street,	Carbondale.
Lupin, Emanuel,	217 Mayland street,	Philadelphia.
Lutz, David P. J.,	353 Beaver avenue,	Allegheny.
Lutz, W. Preston,	301 North Sixth street,	Philadelphia.
Lytle, Ross,	Connellsville,	Fayette county.
MacAdams, Wm. J.,	708 Fifth avenue,	Pittsburg.
MacCormack, Alex.,	2327 Brown street,	Philadelphia.
MacLennan, W. F.,	2022 Woodstock street,	Philadelphia.
Macknight, Horace B.,	Plains,	Luzerne county.
Maconch, Emlen,	Malvern,	Chester county.
Maggini, Robert S.,	914 Main street,	Bradnock.
Magowan, Bella C.,	Kane,	McKean county.
Mangold, Emil E.,	64 Lowrie street,	Allegheny.
Mangold, Oscar G.,	64 Lowrie street,	Allegheny.
Mangold, Wm. B.,	1500 South Broad street,	Philadelphia.
Maples, Murff F.,	145 North Tenth street,	Philadelphia.
Markell, Chas. E.,	Monongahela City,	Washington county.
Marsden, Henry I.,	Towanda,	Bradford county.
Marshall, Chas. E.,	1203 Melon street,	Philadelphia.
Martin, Chas. E.,	Wylandville,	Washington county.
Martin, Clayton E.,	6 Schuylkill avenue,	Reading.
Martin, L. B.,	146 East Market street,	Lewistown.
Martin, Wm. E.,	238 Eighth avenue,	Homestead.
Martz, Geo. E.,	312 North street,	Harrisburg.
Mattern, Ed. P.,	62 Thirteenth street,	Franklin.
Mauger, Henry S.,	1106 Chestnut street,	Philadelphia.
Mayburg, Wm. James,	Slippery Rock,	Butler county.
Mayo, Fred H.,	Munhall,	Allegheny county.
McAvoy, Edward J.,	St. Mary's,	Elk county.
McCanna, John M.,	Columbia,	Lancaster county.
McCarthy, James,	Pittsburg,	Allegheny county.
McCleary, Harry W.,	40 N. 11th street,	Philadelphia.
McCollin, John,	6001 Vine street,	Philadelphia.
McConnel, John P.,	117 Bluff street,	Pittsburg.
McCoubrey, Will J.,	113 Federal street,	Allegheny.
McCoy, Fred. A.,	Smethport,	McKean county.
McCoy, Geo. W.,	3709 Woodland avenue,	Philadelphia.
McCreary, Alice R.,	559 Homewood avenue,	Pittsburg.
McCreary, Fred. N.,	Fairview,	Erle county.
McCreight, Chas.,	1358 Marlborough street,	Philadelphia.
McBride, Herman J.,	Cannonsburg,	Washington county.
McBrinn, Andrew W.,	1535 Thompson street,	Philadelphia.



McDonald, Fred'k T., ..... Kennett Square, ..... Chester county.  
 McDonough, James R., .. Honesdale, ..... Wayne county.  
 McFadden, James T., ..... 1718 Carson street, ..... Pittsburg.  
 McFadden, Thos. F., .... 1440 S. 20th St., ..... Philadelphia.  
 McFarland, Robert L., ... Sharon, ..... Mercer county.  
 McGarra, Wm. H. Jr., .. 1401 Fairmount avenue, .. Philadelphia.  
 McGehee, Hanford B., .... 4099 Lancaster avenue, .. Philadelphia.  
 McGrath, Joseph S., ..... Market and Liberty Sts., Pittsburg.  
 McKeown, Arthur H., ..... Dennison, ..... Ohio.  
 McKnight, J. W. L., ..... 7215 Finance street, ..... Pittsburg.  
 McLernon, Feliz A., .... Conshohocken, ..... Montgomery county.  
 McLure, Bert G., ..... 701 Fifth avenue, ..... McKeesport.  
 McNeill, Robert C., ..... 500 West York street, .... Philadelphia.  
 McMillan, Edwin H., ..... 210 Main street, ..... Braddock.  
 McMillan, John C., ..... 220 W. Washington St., .. New Castle.  
 Meler, August J., ..... 1222 North Fourth street, .. Philadelphia.  
 Meister, Samuel E., .... 143 South Duke street, .... Lancaster.  
 Mellinger, Harvey E., ... Mt. Pleasant, ..... Westmoreland county.  
 Melvin, Edward J., ..... 237 Wyoming avenue, .... Scranton.  
 Melvin, Ernest H., ..... 161 Fifth avenue, ..... Pittsburg.  
 Mengel, Levi W., ..... Reading, ..... Berks county.  
 Meredith, Chas. H., ..... Mella, ..... Delaware county.  
 Meredith, Harry L., .... Hagerstown, ..... Maryland.  
 Meredith, John F., ..... Bellwood, ..... Blair county.  
 Merscher, Geo. E., ..... 160 Richmond street, .... Philadelphia.  
 Metz, Abraham L., ..... 1510 Vine street, ..... Philadelphia.  
 Metzger, Wm. A., ..... 426 Market street, ..... Harrisburg.  
 Metzger, Wm. W., ..... Honesdale, ..... Wayne county.  
 Metzler, Walter, ..... 1011 Walnut street, ..... Philadelphia.  
 Meyer, Felix W., ..... 2101 South Sixth street, .. Philadelphia.  
 Meyers, Geo. H., ..... 4127 Germantown avenue, Philadelphia.  
 Meyers, Judson M., ..... 7 South Main street, .... Wilkes-Barre.  
 Meyers, Theo. E., ..... 101 South Main avenue, .. Scranton.  
 Middleton, Claude R., .... 1922 Mervine street, ..... Philadelphia.  
 Miller, Albert D., ..... 1023 Vine street, ..... Philadelphia.  
 Miller, Charlie B., ..... 1412 Walnut street, ..... Philadelphia.  
 Miller, Harper G., ..... 1011 Fairmount avenue, .. Philadelphia.  
 Miller, Howard A., ..... 1011 Carson street, ..... Pittsburg.  
 Miller, Jefferson L., .... Orwigsburg, ..... Schuylkill county.  
 Miller, John Henry, ..... 6th and Thompson Sts., .. Philadelphia.  
 Miller, Lynford C., ..... Tunkhannock, ..... Wyoming county.  
 Miller, Mary F., ..... 8th ave., and 13th st., ... Altoona.  
 Miller, Roshier, ..... 11th and Oxford Sts., .... Philadelphia.  
 Mills, Leopold J., ..... 2200 N. 15th St., ..... Philadelphia.  
 Mishkin, Jacob, ..... 773 S. 12th St., ..... Philadelphia.  
 Missimer, Harry D., .... 142 South Ninth street, ... Reading.  
 Moeller, Carl F. E., ..... 116 N. 13th St., ..... Harrisburg.  
 Mocherman, N. C., ..... Poland, ..... Ohio.  
 Mohl, August H., ..... York and Cedar streets, .. Philadelphia.  
 Monaghan, Thos. F., .... 2327 North Third street, ... Philadelphia.  
 Montgomery John C., .. 147 East Market street, .. Chambersburg.  
 Mooney, James E., ..... 3112 N. 15th street, ..... Philadelphia.  
 Moore, Geo. C., ..... 1932 N. 11th St., ..... Philadelphia.  
 Moran, Patrick J., ..... Edwardsville, ..... Luzerne county.

Morgan, Clayton E.,	1629 Walnut street,	Philadelphia.
Morris, David H.,	686 Preble avenue,	Allegheny.
Morris, Max,	145 North Tenth street,	Philadelphia.
Morrison, Geo. S.,	Canonsburg,	Washington county.
Moss, Benj. F.,	1267 S. 23d St.,	Philadelphia.
Muelier, Chas. A.,	829 Randolph street,	Philadelphia.
Muir, John R.,	2500 Meredith street,	Philadelphia.
Mullen, Lee M.,	Tioga and Oakwood Sts.,	Pittsburg.
Mundorf, Harry K.,	York,	York county.
Murray, Geo. W.,	Punxsutawney,	Jefferson county.
Murrin, John, Jr.,	1266 Liberty street,	Franklin.
Musselman, John,	4000 Chestnut street,	Philadelphia.
Mussina, Chas. C.,	Cowan,	Union county.
Murphy, Wm. C.,	Mt. Pleasant,	Westmoreland county.
Myers, John Henry,	326 W. Huntingdon St.,	Philadelphia.
Myers, Kirby C.,	1128 Second avenue,	Beaver Falls.
Naas, John P.,	6009 Penn avenue,	Pittsburg.
Naley, Homer V.,	Manor Station,	Westmoreland county.
Nason, John B.,	Townville,	Crawford county.
Nebel, Chas. Wm.,	1828 Frankford avenue,	Philadelphia.
Neely, Horace S.,	1734 N. 13th St.,	Philadelphia.
Neff, Alice,	365 South George street,	York.
Neibert, Adam,	West Newton,	Westmoreland county.
Nesbitt, Arthur E.,	1545 Spring Garden street,	Philadelphia.
Netherton, Edwin A.,	Forty Fort,	Luzerne county.
Neville, Wm.,	2630 E. Lehigh St.,	Philadelphia.
Newman, Samuel A.,	286 Western avenue,	Allegheny.
Nichols, John B.,	2967 Frankford avenue,	Philadelphia.
Nick, Mary E.,	2404 Peach street,	Erie.
Nick, Wm. H. F.,	928 State street,	Erie.
Nicodemus, Edwin A.,	2150 North Seventh St.,	Philadelphia.
Nixon, Wm. H.,	26 Pennsylvania avenue,	Uniontown.
Nolte, Harry R.,	8th and McKean Sts.,	Philadelphia.
Notley, Wm. T.,	1500 S. 22d St.,	Philadelphia.
Nourse, Jennie,	190 Centre avenue,	Pittsburg.
Nowlin, Thos. B.,	Saxton,	Bedford.
Obear, Josiah J.,	7th and Spruce Sts.,	Philadelphia.
O'Donnell, David H.,	1860 Callowhill street,	Philadelphia.
Ogden, Joseph D.,	Hairsville,	Indiana county.
Oglevee, Wm. H.,	26 Pennsylvania avenue,	Uniontown.
Ohall, Irvin E.,	210 North Tenth street,	Philadelphia.
Ople, Ralph R.,	5175 Jefferson street,	Philadelphia.
Osborn, Daniel C.,	Honesdale,	Wayne county.
Pagan, Edward F.,	Wellsboro,	Tioga county.
Parker, Howard E.,	1137 Fairmount avenue,	Philadelphia.
Parrish, Francis J., Jr.,	Lilly,	Cambria county.
Parry, Wm. H.,	Newtown,	Bucks county.
Parse, Andrew C.,	1252 S. 13th St.,	Philadelphia.
Parvin, John P.,	254 South Fourth street,	Reading.
Patterson, Chas. M.,	105 S. Washington St.,	Wilkes-Barre.
Patterson, Robert A.,	Spring Creek,	Warren county.
Pauly, Joseph C.,	104 Gist street,	Pittsburg.
Pearce, Samuel R.,	1801 Chestnut street,	Philadelphia.
Pearce, Ernest C.,	Livermore,	Westmoreland county.

Peacock, Geo. K.,	223 Market street,	Kittanning.
Pelffer, Chas. O.,	Morton,	Delaware county.
Peil, G. Wm.,	Carbondale,	Lackawanna county.
Peissahkovitch, M.,	529 Pine street,	Philadelphia.
Pellett, Edmund B.,	4000 Chestnut street,	Philadelphia.
Penn, John N.,	Waynesburg,	Greene county.
Perry, Wm. A.,	New Castle,	Lawrence county.
Perse, James W.,	632 N. 18th St.,	Philadelphia.
Pfoutz, Jacob W.,	60 North Prince street,	Lancaster county.
Pierce, Herman J.,	1518 Poplar street,	Philadelphia.
Pierce, Thos. J.,	Frackville,	Schuylkill county.
Pierson, Alfred M.,	35th and Sunnyside Sts.,	Philadelphia.
Pike, Julius F.,	32 North Ninth street,	Philadelphia.
Place, Chas. R.,	1010 Cherry street,	Philadelphia.
Pomeroy, Laura B.,	Dushore,	Sullivan county.
Porter, Will M.,	Connellsville,	Fayette county.
Powers, J. Arthur,	2335 Berks street,	Philadelphia.
Preston, Gilbert K.,	511 South Ninth street,	Philadelphia.
Punt, Arnold A. J.,	523 Jane street,	Philadelphia.
Quinn, J. Spurgeon,	Du Bois,	Clearfield county.
Raker, John W.,	155 W. Huntingdon St.,	Philadelphia.
Ramsey, Agnes S.,	West Bridgewater,	Beaver county.
Rankin, David M.,	62 Federal street,	Allegheny.
Rankin, Edgar A.,	643 Fifth avenue,	Pittsburg.
Rathmell, Albert R.,	Cadwallader,	Philadelphia.
Reed, Arthur B.,	153 W. Huntingdon St.,	Philadelphia.
Reed, Arthur C.,	Holidaysburg,	Blair county.
Reed, George O.,	10th and Arch Sts.,	Philadelphia.
Reeder, Mrs. Mary E.,	Millersville,	Lancaster county.
Reeve, James W.,	5th and Callowhill Sts.,	Philadelphia.
Reidenbach, Chas. T.,	78 North Main street,	Washington.
Reinhold, John,	1512 Peach street,	Erle.
Remig, John H.,	1201 Christian street,	Philadelphia.
Remley, Chas. C.,	38th and Aspen street,	Philadelphia.
Rewalt, Jay W.,	Middletown,	Dauphin county.
Rhodes, Chas. E.,	417 Fifth avenue,	Altoona.
Rice, Robert G.,	Rome,	Bradford county.
Richard, John B.,	Plymouth,	Luzerne county.
Richards, Miles,	701 Fifth avenue,	McKeesport.
Richardson, James,	941 Spruce street,	Philadelphia.
Richardson, Neafie,	15th and Moore Sts.,	Philadelphia.
Richart, Frank E.,	New Albany,	Bradford county.
Richman, Edward M.,	154 North Eleventh St.,	Philadelphia.
Ricker, Wm. H.,	Hummelstown,	Dauphin county.
Rieben, Ernest,	2318 N. 28th St.,	Philadelphia.
Rihn, Edward J.,	64 Chestnut street,	Allegheny.
Ringer, Lewis J.,	239 S. 11th St.,	Philadelphia.
Rinker, Henry P.,	Camden,	New Jersey.
Ritter, Wm. Henry,	145 North Tenth street,	Philadelphia.
Ritter, Wm. Joseph,	1224 Schackamaxon St.,	Philadelphia.
Ritz, Chas. A.,	7th and Montgomery Ave.,	Philadelphia.
Robbins, Geo. D.,	1345 Vine street,	Philadelphia.
Robert, Harry W.,	310 York avenue,	West Pittston.
Roberts, Wm. Henry,	145 North Tenth street,	Philadelphia.

Robertson, Henry E. Jr.,	3213 N. 17th St.,	Philadelphia.
Robinson, James D.,	Shippensburg,	Cumberland county.
Robinson, Joseph,	343 North Second street,	Philadelphia.
Robinson, Raleigh,	Hatboro,	Montgomery county.
Rock, Geo. M.,	Latrobe,	Westmoreland county.
Roedemoyer, Wm. E.,	501 Second avenue,	Pittsburg.
Rogers, Geo. R.,	Carbondale,	Lackawanna county.
Roof, Frank H.,	Uniontown,	Crawford county.
Ross, Frank B.,	Vincentown,	New Jersey
Roth, Francis J.,	807 Green street,	Philadelphia.
Rothrock, Harry G.,	2d and Dauphin Sts.,	Philadelphia.
Rothwell, Walter,	Willow Grove,	Montgomery county.
Rosenzweig, Chas. J.,	299 Ohio street,	Allegheny
Dovno, Pinkas,	724 South Third street,	Philadelphia.
Rowse, E. F.,	Dravosburg,	Allegheny.
Ryckman, Rachael A.,	Export,	Westmoreland county.
Ryland, Geo. B.,	264 South Ninth Street,	Philadelphia.
Saalback, Carl,	2128 Forbes street,	Pittsburg.
Saalback, Louis,	431 Market street,	Pittsburg.
Sager, Verner E.,	1801 Chestnut street,	Philadelphia.
Sallada, Hunter,	Mahanoy City,	Schuylkill county.
Sallade, Raymond E.,	Wormelsdorf,	Berks county.
Sample, J. Frank,	Mechanicsburg,	Cumberland county.
Sander, John Chas.,	5112 Butler street,	Pittsburg.
Sanders, Joseph O.,	Mifflinburg,	Union county.
Sandles, Van A.,	2328 Eighth avenue,	Beaver Falls.
Sapp, Wm. E.,	Dagus Mines,	Elk county.
Sausser, Howard E.,	424 Spruce street,	Reading.
Scarborough, Geo. W.,	1140 E. Susquehanna Ave.,	Philadelphia.
Schabinger Chas.,	21st and Pine Sts.,	Philadelphia.
Schad Harry J. G.,	211 N 13th St.,	Philadelphia.
Schaefer, Louis C.,	501 South Fourth street,	Philadelphia.
Schaeffer, Otis O.,	Middletown,	Dauphin county.
Schafer, Chas. A.,	4300 Butler street,	Pittsburg.
Scheirer, F. B.,	31 North Fifth street,	Philadelphia.
Scheirer, Victor D.,	Swarthmore,	Delaware county.
Scheller, Wm. Chas.,	Erie,	Erie county
Scheller, W. J.,	727 Emily street,	Philadelphia.
Schen, Will J.,	Washington,	Washington county.
Scherer, B. F.,	3806 Mt. Vernon street,	Philadelphia.
Scheuhing, John B.,	6th and McKean Sts.,	Philadelphia.
Schlebel, Jacob W., Jr.,	Duryea,	Luzerne county.
Schilling, Edwin T.,	80 Washington avenue,	Pittsburg.
Schilling, Frank,	1151 Mervine street,	Philadelphia.
Schindel, David P.,	34th and Woodland ave.,	Philadelphia.
Schlabach, Edward,	437 Northampton street,	Easton.
Schlauch, Theo. S.,	Darby,	Delaware county.
Schlegel, Emil,	7th and Lombard Sts.,	Philadelphia.
Schmerker, Chas. F.,	396 Union street,	Allentown.
Schmickle, Chas. F.,	Nazareth,	Northampton county.
Schmitt, Albert H.,	941 Spruce street,	Philadelphia.
Schnee, Wm. J.,	Mt. Carmel,	Northumberland county.
Schneider, K. T. C.,	624 N. 12th St.,	Philadelphia.
Schnurman, H. S.,	317 Arch street,	Philadelphia.

Schonberger, G. E., .....2d and Hellam street, ...Wrightsville.  
 Schotte, Karl B., .....Kittanning, ..... Armstrong county.  
 Schroder, Johann H., ....11th and Bainbridge Sts., Philadelphia.  
 Schwartz, L. L., .....143 Market street, ..... Brownsville.  
 Scott, Kent C., ..... Monongahela City, ..... Washington county.  
 Seaman, H. W., .....145 North Tenth street, .. Philadelphia.  
 Selpel, Harry B., .....874 North Fourth street, .. Philadelphia.  
 Seiss, Andrew E., .....3867 Warren street, ..... Philadelphia.  
 Sellen, Edward C., .....525 Argyle street, ..... Philadelphia.  
 Sellers, Oscar W., .....1019 Vine street, ..... Philadelphia.  
 Sellers, Walter S., .....240 South Second street, .. Chambersburg.  
 Semmel, Frank P., Jr., ...138 North Second street, .. Lehighton.  
 Semple, Henry B., Jr., ...35 North 54th street, ..... Philadelphia.  
 Semple, John, .....3d and Howell Sts., ..... Chester.  
 Senft, Elmer E., .....241 West James street, ... Lancaster.  
 Settle, Peter S., .....4132 Thomas street, ..... Frankford.  
 Seubert, Chas. A., .....1200 Locust street, ..... Philadelphia.  
 Seybert, R. B. B., ..... Williamsport, ..... Lycoming.  
 Seyforth, Julius F., .....2167 E. Cumberland St., ... Philadelphia.  
 Shaff, Oliver B., ..... Irwin, ..... Westmoreland county.  
 Shaffer, John E., .....324 Elghth avenue, ..... Homestead.  
 Shaner, John W., .....Main and Wabash Aves., Pittsburg.  
 Shannon, James D., .....Youngsville, ..... Warren county.  
 Shapira, Isaac, ..... Plymouth, ..... Luzerne county.  
 Shaw, John T., .....1616 Howarth street, ..... Frankford.  
 Sheitz, Lloyd A., .....3d and Washington Ave.,... Philadelphia.  
 Shelton, Chas. F., .....New Castle, ..... Lawrence county.  
 Shenk, John B., .....4473 Germantown avenue, Philadelphia.  
 Sherger, John A., .....120 Short street, ..... Harrisburg.  
 Sherwin, Robert, .....157 North Tenth street, .. Philadelphia.  
 Shilling, C. A., .....171 Chestnut street, ..... Allegheny.  
 Shreve, Alex., .....2124 N. 30th street, ..... Philadelphia.  
 Shull, Alex. B., .....3928 Market street, ..... Philadelphia.  
 Shultz, John W., .....724 North Eighth street, .. Philadelphia.  
 Sibson, Wm. H., .....Oxford, ..... Chester county.  
 Sickel, Wm. A., .....Snow Shoe, ..... Centre county.  
 Sieber, I. Grafton, .....632 N. 18th St., ..... Philadelphia.  
 Siebert, Chas. W., .....5600 Penn avenue, ..... Pittsburg.  
 Slegfried, Harvey M., ...956 Walnut street, ..... Allentown.  
 Silvard, J. K., .....New Albany, ..... Bradford county.  
 Siggins, Frank W., .....Meadville, ..... Crawford county.  
 Simmons, Frank W., .....Minersville, ..... Schuylkill county.  
 Simonis, Otto, Jr., .....818 New Market street, .. Philadelphia.  
 Simons, Harry F., .....6th and Diamond sts., ... Philadelphia.  
 Simpler, W. E., .....4043 Market street, ..... Philadelphia.  
 Sisler, L. Wm., .....Bridgeport, ..... Montgomery county.  
 Skeath, Geo. W., .....1601 Passyunk avenue, ... Philadelphia.  
 Slack, Geo. C., .....1804 West Third street, ... Thurlow.  
 Sloan, A. McClure, .....164 West Fourth street, .. Erie.  
 Slott, Horatio A., .....Coatesville, ..... Chester county.  
 Slough, Libbie O., .....845 Hamilton street, ..... Allentown.  
 Smink, Alfred H., .....Shamokin, ..... Northumberland county.  
 Smink, Henry G., .....Shamokin, ..... Northumberland county.  
 Smith, Allen H., .....2543 North Seventh street, Philadelphia.

Smith, Benj. J.,	1427 E. Montgomery Ave.,	Philadelphia.
Smith, Chas. H.,	222 East Ninth street,	Chester county.
Smith, Chas. O.,	Hartleton,	Union county.
Smith, David W.,	Washington,	Washington county.
Smith, Horace L.,	610 Clay avenue,	Jeannette.
Smith, H. Lyons,	Pittston,	Luzerne county.
Smith, James R.,	106 Buena Vista street,	Allegheny.
Smith, John B.,	5400 Germantown avenue,	Germantown.
Smith, John R.,	1629 Walnut street,	Philadelphia.
Smith, L. Worden,	14 South Market street,	Shamokin.
Smith, M. N.,	Reynoldston,	Allegheny.
Smith, Rodney,	1408½ Arch street,	Philadelphia.
Smith, Thos. R.,	13th and Race Sts.,	Philadelphia.
Smith, Walter L.,	64 Chestnut street,	Allegheny.
Smith, Walter V.,	2d and Green sts.,	Philadelphia.
Smyser, Willis L.,	235 West York avenue,	York county.
Snively Clarence O.,	Lebanon,	Lebanon county.
Snyder, Wm. H.,	13th and Market Sts.,	Harrisburg.
Snyder, Wm. L.,	Media,	Delaware county.
Soffel, Albert E.,	315 Smithfield street,	Pittsburg.
Soffel, August,	Greenbush street,	Pittsburg.
Spayd, Henry E.,	159 East Market street,	Wilkes-Barre.
Spears, Edward G.,	506 South Sixth street,	Reading.
Spence, Wm. A.,	1122 Mt. Vernon street,	Philadelphia.
Spidel, Frank M.,	2567 East Norris street,	Bradford.
Spotts, Albert O.,	920 Spruce street,	Philadelphia.
Sprout, Warren A.,	31 North Fourth street,	Williamsport.
Sprowles, Walter H.,	1649 Harrison street,	Frankford.
Stahel, Albert W.,	29th and Diamond Sts.,	Philadelphia.
Staley, Maude E.,	737 Fifth avenue,	McKeesport.
Stanger, Lawrence A.,	4343 Main street,	Frankford.
Stanton, John E.,	1638 N. 19th St.,	Philadelphia.
Stanton, Thos. J.,	1900 Green street,	Philadelphia.
Steadman, M. L.,	145 North Tenth street,	Philadelphia.
Steel, Harry E.,	Huntingdon,	Huntingdon county.
Steele, G. E.,	Greensburg,	Westmoreland county.
Steele, Hurbert A.,	717 Carson street,	Pittsburg.
Steiner, Ephraim H.,	South Easton,	Northampton county.
Steinmetz, George C.,	212 Holland street,	Erle.
Steinmetz, Wm. B.,	630 S. 11th St.,	Philadelphia.
Steltz, Louis H.,	157 Pennsylvania avenue,	Allegheny.
Steltz, Harry S.,	324 Chestnut street,	Pottstown.
Stengel, Arthur,	246 S. 22d St.,	Philadelphia.
Stern, Lee,	Uniontown,	Fayette county.
Stern, Wm. A.,	1126 Girard street,	Philadelphia.
Stevens, Thos. R.,	746 S. 15th St.,	Philadelphia.
Stewart, Chas. J.,	178 Lacock street,	Allegheny.
Stewart, Samuel S.,	1137 Derry street,	Harrisburg.
Stine, Howard F.,	Mt. Carmel,	Northumberland county.
Stirling, David C.,	3339 Woodland avenue,	Philadelphia.
Stoever, Harvey V.,	Chester,	Delaware county.
Stoke, Geo. W.,	Reynoldsville,	Jefferson county.
Stommel, Henry A.,	Doylestown,	Bucks county.
Storey, Chester,	Phoenixville,	Chester county.

Stout, Oliver A.,	13th and Green Sts.,	Philadelphia.
Stout, Philip S.,	29th and Columbia Ave.,	Philadelphia.
Strawinski, Jacob F.,	618 York street,	Philadelphia.
Streeper, Austin,	311 Haws avenue,	Norristown.
Strickler, Geo. Jr.,	Lebanon,	Lebanon county.
Strong, Mary,	Altoona,	Blair county.
Strott, Geo. G.,	Greensburg,	Westmoreland county.
Stroud, John G.,	West Chester,	Chester county.
Stroup, Freeman P.,	Rouseville,	Venango county.
Stuart, Robert C.,	932 Marshall street,	Philadelphia.
Stump, Adam F. M.,	245 N. 12th St.,	Philadelphia.
Studebaker, L. H.,	1026 Parade street,	Erie.
Studholme, P. F.,	Smethport,	McKean county.
Stuebner, Albert J.,	4727 Liberty avenue,	Pittsburg.
Sullivan, Chas. E.,	Waynesboro,	Franklin county.
Sutter, Wm. L.,	606 Seventh avenue,	Beaver Falls.
Sutton, John D.,	321 South Main street,	Wilkes-Barre.
Sutton, Mrs. Josie,	Jeannette,	Westmoreland county.
Swainbank, Chas. M.,	72 South Main street,	Wilkes-Barre.
Swartz, Calvin I.,	Gettysburg,	Adams county.
Sweeley, J. E.,	Williamsport,	Lycoming county.
Sykes, Wm. W.,	Norristown,	Montgomery county.
Tafel, Gustave H.,	1320 Jefferson street,	Philadelphia.
Taylor, Bessie E.,	100 Lexington avenue,	Altoona.
Taylor, Harry B.,	108 Fulton street,	Pittsburg.
Taylor, James,	542 Central avenue,	Johnstown.
Taylor, W. Clark,	Vineland,	New Jersey.
Teepie, Harry S.,	Sixth and Vine streets,	Philadelphia.
Terppe, Julia,	510 Cedar avenue,	Scranton.
Terry, John H.,	143 N. 11th St.,	Philadelphia.
Thomas, Frank B.,	309 Water street,	Johnstown.
Thomas, Howard E.,	2051 Camac street,	Philadelphia.
Thomas, James D.,	Evans City,	Butler county.
Thomas, John L.,	905 Walnut street,	McKeesport.
Thompson, Geo. N.,	3925 Germantown avenue,	Philadelphia.
Thompson, Harley S.,	Union City,	Erie county.
Thompson, Harry M.,	1300 South Fifth street,	Philadelphia.
Thompson, Henry K.,	1211 Mt. Vernon street,	Philadelphia.
Thompson, Nathan L.,	1828 Mt. Vernon street,	Philadelphia.
Thompson, Robert D.,	Freedom,	Beaver county.
Thorley, Alfretta M.,	1839 North Sixth street,	Harrisburg.
Thorton, Michael T.,	16th and Summer Sts.,	Philadelphia.
Thrush, Morris C.,	33d and Haverford Sts.,	Philadelphia.
Tiefenbach, J. Fred,	South Bethlehem,	Northampton county.
Tiffany, Minnie E.,	Pleasant Mount,	Wayne county.
Tinsman, Edward W.,	238 N. 13th St.,	Philadelphia.
Tobias, J. H.,	3149 North Broad street,	Philadelphia.
Todd, Chas. K.,	3928 Market street,	Philadelphia.
Toelke, Chas.,	1629 Walnut street,	Philadelphia.
Tomlinson, Geo. W.,	824 West Somerset street,	Philadelphia.
Tomlinson, Walter,	1021 Seventh avenue,	Beaver Falls.
Touhill, James P.,	214 North Main street,	Pittston.
Tower, Theo. S.,	85 James street,	Allegheny.
Towles, Therret R.,	1010 Cherry street,	Philadelphia.

Towsend, J. Percy, .....	5130 Tacony street, .....	Frankford.
Tracy, Geo. T., .....	1037 South Third street, ..	Philadelphia.
Tragesser, E. C., .....	Lancaster, .....	Lancaster county.
Traub, Elmer, .....	22d and Ellsworth Sts., ..	Philadelphia.
Tressise, John E., .....	23 Fourth avenue, .....	Pittsburg.
Troxell, Fred'k B., .....	1737 Gratz street, .....	Philadelphia.
Turner, Wm. J., .....	2136 Fifth avenue, .....	Pittsburg.
Uberroth, Harvey M., ....	19th and Oxford Sts., ....	Philadelphia.
Ullmann, Geo. A., .....	235 South Ninth street, ..	Philadelphia.
Van Buskirk, Thos. F., ..	822 West Lehigh avenue, ..	Philadelphia.
Vance, Wm. S., .....	Washington, .....	Washington county.
VanCleve, Wm. C., .....	Gettysburg, .....	Adams county.
Verstine, Mall, .....	Brookville, .....	Jefferson county.
Voss, Adolf C., .....	2602 E. Allegheny Ave., ..	Philadelphia.
Wachtel, John K., .....	1717 South Eighth street, ..	Philadelphia.
Wahle, Edwin, .....	2300 Oxford street, .....	Philadelphia.
Walte, Henry F., .....	2401 East York street, ....	Philadelphia.
Walte, Sadie E., .....	Sugar Notch, .....	Luzerne county.
Walder, Paul J., .....	4939 Germantown avenue, ..	Germantown.
Walker, James R. H., ....	Blairsville, .....	Indiana county.
Walker, John J., .....	130 South Main street, ....	Greensburg.
Walling, A. E. E., .....	Spartansburg, .....	Crawford county.
Walter, Wm. B., .....	800 Walnut street, .....	Philadelphia.
Ward, Merton B., .....	3740 Powelton avenue, ....	Philadelphia.
Warren, Roy, .....	Elkland, .....	Tioga county.
Wasley, Fred S., .....	211 North Thirteenth St., ..	Philadelphia.
Wather, Ernest T., .....	64 Chestnut street, .....	Allegheny.
Watson, Jonathan I., ....	2602 Germantown avenue, ..	Philadelphia.
Watson, Walter W., ....	18th and Lombard Sts., ..	Philadelphia.
Weakley, Chas. C., .....	U. S. Naval Hospital, ....	Philadelphia.
Weaver, Wilmer J., .....	640 N. 11th St., .....	Philadelphia.
Weber, Paul J., .....	39 North Tenth street, ....	Philadelphia.
Weber, Wm., .....	700 N. 43d St., .....	Philadelphia.
Welda, Chas. A., .....	238 N. 12th St., .....	Philadelphia.
Weirick, Ernest C., .....	516 State street, .....	Harrisburg.
Weiss, Chas. J., .....	1376 Second avenue, ....	Pittsburg.
Weitzel, Sue C., .....	22d and N. College Ave., ..	Philadelphia.
Welch, Frank R., .....	Nicholson, .....	Wyoming county.
Weller, Harry C., .....	730 N. 16th St., .....	Philadelphia.
Wendel, Samuel S., .....	Lewisburg, .....	Union county.
Wentzler, H. G., .....	1103 Green street, .....	Philadelphia.
Westcott, Frank, .....	Media, .....	Delaware county.
Weston, Edythe, .....	1422 Moore street, .....	Philadelphia.
Wheeler, Wm. B., .....	80 Washington avenue, ..	Pittsburg.
Whilt, John H., .....	2065 Ann street, .....	Philadelphia.
Whitacre, Lewis R., ....	Mt. Holly, .....	New Jersey.
White, Robert W., .....	2429 Frankford avenue, ..	Philadelphia.
Whitley, John C., .....	720 North Tenth street, ..	Philadelphia.
Whitman, Wm. J., .....	2400 N. 19th street, .....	Philadelphia.
Wilcox, Wm. B., .....	Haddonfield, .....	New Jersey.
Widdup, Charlie, .....	1629 Second avenue, ....	Pittsburg.
Wieland, Charles, .....	2065 Moore street, .....	Philadelphia.
Weinsinger, A. J., Jr., ...	Carnegie, .....	Allegheny county.
Welsner, A. H., .....	2317 East Norris street, ...	Philadelphia.



- A. H. Briney, West Penn Medical College.  
Allan Colby Brooks, Jefferson Medical College.  
Harry M. Brown, University of Pennsylvania.  
Harry Butler Bruner, College of Physicians and Surgeons, Baltimore.  
Frank G. Bryant, College of Physicians and Surgeons, Baltimore.  
Frederick C. Bucher, University of Pennsylvania.  
Richard D. Burke, Jefferson Medical College.  
Edwin D. Burkhard, University of Pennsylvania.  
Harry B. Burns, Bellevue Hospital Medical College and University of New York.  
William J. Butler, Long Island College Hospital, Brooklyn.  
Howard B. Buterbaugh, Western Reserve University.  
Joseph Clarence Caldwell, West Penn Medical College.  
Hugh J. Call, University of Pennsylvania.  
William Oscar Cameron, Western Reserve University.  
Robert Benjamin Campbell, Medico-Chirurgical College.  
Robert F. Carmody, Georgetown Medical College.  
Mead Charles Carpenter, West Penn Medical College.  
Charles J. Carroll, University of Pennsylvania.  
George W. Carr, Jefferson Medical College.  
George N. Chakaloff, University of Pennsylvania.  
Oscar D. F. Clark, Jefferson Medical College.  
John W. Clark, Medico-Chirurgical College.  
Emma O. Cleaver, Woman's Medical College.  
Elwyn Stevens Coburn, Medico-Chirurgical College.  
James Leeper Cochran, West Penn Medical College.  
Jesse Franklin Cogan, Baltimore Medical College.  
David W. Cole, Baltimore University.  
Thomas L. Coley, University of Pennsylvania.  
Frederic Garvin Conger, West Penn Medical College.  
William Jay Cook, Baltimore Medical College.  
Henry Joseph Costello, Jefferson Medical College.  
Ira H. Cotton, West Penn Medical College.  
Silas W. Covell, West Penn Medical College.  
Joseph W. Crowley, University of Pennsylvania.  
Clyde W. Crumrine, Western University of Pennsylvania.  
Samuel Thomas Cabbage, Jefferson Medical College.  
William Curry, Jefferson Medical College.  
George E. Dahis, Medico-Chirurgical College.  
John Dale, Columbian University, Washington.  
Wallace H. Dale, College of Physicians and Surgeons, Baltimore.  
Charles Wesley Davis, West Penn Medical College.  
Harry Hibert Davis, Western University of Pennsylvania.

- John McMillan Davis, West Penn Medical College.  
Thomas Norvelle Dean, West Penn Medical College.  
Harry William Dechert, University of Pennsylvania.  
Frances Denner, Woman's Medical College.  
Henry Leone Dexter, Jefferson Medical College.  
Harold Diefenderfer, University of Pennsylvania.  
George M. Dill, University of Pennsylvania.  
Joseph Beattie Dodds, University of Pennsylvania.  
Harry J. Donaldson, University of Pennsylvania.  
Robert L. Donoghue, University of Pennsylvania.  
Robert Norton Downs, Jr., University of Pennsylvania.  
Ellwood L. Drake, University of Pennsylvania.  
Homer Graham Duncan, Jefferson Medical College.  
Rose M. Dunn, Woman's Medical College.  
Edwin K. Dunkel, Jefferson Medical College.  
Charles H. Earhart, University of Pennsylvania.  
Clarence T. Faries, Medico-Chirurgical College.  
Carle Lee Felt, University of Pennsylvania.  
Engene C. Fetter, University of Pennsylvania.  
Francis Howard Finley, College of Physicians and Surgeons, Baltimore.  
Harry C. Fisler, University of Pennsylvania.  
William W. Fitzgerald, Jefferson Medical College.  
Melvin M. Franklin, University of Pennsylvania.  
George W. H. Frew, University of Pennsylvania.  
Clarence H. Fritz, University of Pennsylvania.  
Robert Gardner Furst, University of Pennsylvania.  
Sylvester Carpenter Gearhart, Jefferson Medical College.  
T. Perceval Gerson, University of Pennsylvania.  
McLeod M. George, West Penn Medical College.  
John Gilbert, Jefferson Medical College.  
John J. Gilbride, University of Pennsylvania.  
Martin S. Gillespie, University of Pennsylvania.  
Claudius W. Gillette, Jefferson Medical College.  
Edward Harry Gingrich, University of Pennsylvania.  
J. Claxton Gittings, University of Pennsylvania.  
John Ernest Gould, Western University of Pennsylvania.  
Charles Taylor Graves, University of Pennsylvania.  
Adelaide M. Griffin, Woman's Medical College of the New York Infirmary.  
Albert Edwin Hager, Jefferson Medical College.  
Franklin Gregg Haines, Baltimore Medical College.  
Frank Clinch Hammond, Jefferson Medical College.  
William J. Hammond, Medico-Chirurgical College.  
George Carson Hanna, Medico-Chirurgical College.

- William R. Hannum, University of Pennsylvania.  
Frank D. Harris, University of Pennsylvania.  
Irvin H. Hartman, University of Pennsylvania.  
Edwin H. Harvey, University of Pennsylvania.  
George L. Hays, University of Pennsylvania.  
Edwin Abeles Heller, University of Pennsylvania.  
John Norman Henry, University of Pennsylvania.  
Louis T. Hess, Jefferson Medical College.  
Walter S. Hibshman, Medico-Chirurgical College.  
Anbrey F. Higgins, University of Pennsylvania.  
Francis J. Higgins, University of Pennsylvania.  
Robert A. Hildebrand, College of Physicians and Surgeons, Baltimore.  
Bower E. Himes, Jefferson Medical College.  
William W. Hoffman, Jefferson Medical College.  
Charles M. Hollister, University of Pennsylvania.  
James L. Hornbeck, University of Pennsylvania.  
Percy L. Hoover, Jefferson Medical College.  
Walter M. Hornby, Medico-Chirurgical College.  
Parker P. Horner, University of Louisville, Medical Department.  
Charles A. Hottenstein, Jefferson Medical College.  
Frank R. Humphreys, College of Physicians and Surgeons, Baltimore.  
James S. Hunter, West Penn Medical College.  
George R. James, Medico-Chirurgical College.  
Hugh D. Jamison, University of Pennsylvania.  
Elbin J. Johnson, West Penn Medical College.  
Edwin B. Johnston, West Penn Medical College.  
Louis T. Kennedy, University of Pennsylvania.  
Delno E. Kercher, University of Pennsylvania.  
Harry B. King, Jefferson Medical College.  
George M. Kinner, University of Pennsylvania.  
Thomas J. Kirkpatrick, Jr., University of Virginia.  
Clinton J. Kistler, University of Pennsylvania.  
J. Warren Knedler, University of Pennsylvania.  
Joseph R. Knight, Medico-Chirurgical College.  
Isadore Kolb, Jefferson Medical College.  
George H. Krall, University of Pennsylvania.  
Palmer J. Kress, Jefferson Medical College.  
John C. Laidley, University of Pennsylvania.  
LaBarre Jay Leamy, University of Pennsylvania.  
Kate Wissler Leatherman, Woman's Medical College.  
LeRoy Y. Lechner, Jefferson Medical College.  
Harry L. Leeke, University of Pennsylvania.  
William Henry Lehner, West Penn Medical College.  
Clarence F. M. Leidy, University of Pennsylvania.

Milton J. Lichty, University of Pennsylvania.  
Howard H. Lilly, University of Pennsylvania.  
Roland S. Lindsay, University of Pennsylvania.  
Louis E. Livingood, University of Pennsylvania.  
Louis Leob, Jefferson Medical College.  
William Porter Logue, University of Pennsylvania.  
Meade M. Loucks, University of Pennsylvania.  
Elizabeth M. Lovelace, Woman's Medical College.  
John Bodine Lowman, Jefferson Medical College.  
Isaac Walter Lytle, University of Pennsylvania.  
Jeremiah Fletcher Lutz, College of Physicians and Surgeons, Baltimore.  
William Reynolds Lyon, Jefferson Medical College.  
Francis James Madden, West Penn Medical College.  
Augustus Carl Maisch, University of Pennsylvania.  
Enos S. Mann, University of Pennsylvania.  
William John J. Manning, Jefferson Medical College.  
Willard L. Maris, University of Pennsylvania.  
George William Mathews, University of Pennsylvania.  
Charles Atlee Meals, Jefferson Medical College.  
William Craig Meanor, University of Pennsylvania.  
Walter E. Miller, West Penn Medical College.  
William Henry Miller, Medico-Chirurgical College.  
Elizabeth K. Miller, Woman's Medical College.  
Robert G. Miles, Jefferson Medical College.  
Jacob Mishkin, Medico-Chirurgical College.  
Mary L. Montgomery, Woman's Medical College.  
Rose Morgan, Woman's Medical College.  
Samuel E. Mowery, University of Pennsylvania.  
John Holmes Murray, Medico-Chirurgical College.  
Walter Scott Musser, Jefferson Medical College.  
Daniel J. McCarthy, University of Pennsylvania.  
Willison H. McCombs, West Penn Medical College.  
Harry E. McDowell, West Penn Medical College.  
Norris S. McDowell, University of Pennsylvania.  
Charles E. McGirk, University of Pennsylvania.  
Ralph F. McHenry, West Penn Medical College.  
George D. McIwaine, West Penn Medical College.  
Thomas K. McKee, Medico-Chirurgical College.  
Elizabeth McLaughry, Woman's Medical College.  
Samuel H. Neal, Medico-Chirurgical College.  
Christian Nelson, West Penn Medical College.  
Adolphus L. Nevin, West Penn Medical College.  
John C. Orr, University of Pennsylvania.  
Henry Russell Pemberton, Columbia College, New York.

Harry E. Peterman, Baltimore Medical College.  
James H. Peterman, Baltimore Medical College.  
Henry F. Pflueger, Medico-Chirurgical College.  
George W. Pfromm, Medico-Chirurgical College.  
Josephine Phelps, Woman's Medical College.  
William C. Pickett, Jefferson Medical College.  
John Wesley Porter, University of Maryland.  
Victor W. Porter, West Penn Medical College.  
David W. Postles, Howard University, Washington, D. C.  
George A. Poust, Jefferson Medical College.  
Charles Edward Quetil, University of Pennsylvania.  
Charles C. Rankin, University of Pennsylvania.  
George S. Ray, University of Pennsylvania.  
John J. Rectenwald, University of Pennsylvania.  
George A. Reed, University of Pennsylvania.  
Clara Reimel, Woman's Medical College.  
David V. Reinoehl, University of Pennsylvania.  
Thomas Harper Rice, University of Pennsylvania.  
Ellerslie W. Richards, University of Pennsylvania.  
George N. Richmond, University of Pennsylvania.  
Walter A. Rigg, University of Pennsylvania.  
John D. Riley, University of Pennsylvania.  
Howard M. Ritter, Jefferson Medical College.  
Clifton Z. Robbins, University of Pennsylvania.  
James E. Robbins, University of Pennsylvania.  
Edward R. Roderick, University of Pennsylvania.  
Robert M. Rodgers, Bellevue Hospital Medical College.  
William John Roe, Jefferson Medical College.  
William R. Roedel, University of Pennsylvania.  
John J. Robrecht, University of Pennsylvania.  
Arthur E. Roose, Jefferson Medical College.  
Edward S. Rosenberry, Jefferson Medical College.  
Lazarus Rosenthal, West Penn Medical College.  
Henry A. Rothrock, University of Pennsylvania.  
William M. Roueche, College of Physicians and Surgeons, Baltimore.  
Andrew L. Russell University of Pennsylvania.  
John Mack Russell, West Penn Medical College.  
James T. Schell, Medico-Chirurgical College.  
Edward R. Schreiner, University of Pennsylvania.  
Franklin B. Schreiner, University of Pennsylvania.  
Mary Alice Schively, Woman's Medical College.  
William Schlief, University of Pennsylvania.  
Joseph J. Schlutis, Medico-Chirurgical College.  
William C. Schultz, Jefferson Medical College.

J. William Schultz, Medico-Chirurgical College.  
William L. Scott, University of Pennsylvania.  
Alice M. Seabrook, Women's Medical College.  
Leedom Sharpe, Medico-Chirurgical College.  
Arthur B. Shatto, College of Physicians and Surgeons, Baltimore.  
John F. Shaw, Medico-Chirurgical College.  
Ernest N. Shepard, Jefferson Medical College.  
Mary McDowell Schick, Woman's Medical College.  
Nicholas G. L. Shillito, West Penn Medical College.  
Sterling De La Shimer, University of Pennsylvania.  
Joseph W. Sherer, University of Iowa.  
B. Frank Shires, Medico-Chirurgical College.  
Bernard W. Shirey, College of Physicians and Surgeons, Baltimore.  
Charles S. Shoaf, Keokuk Medical College.  
Frank R. Shoemaker, Medico-Chirurgical College.  
Samuel Z. Shope, University of Pennsylvania.  
Louise May Shryock, University of Wooster.  
Thomas G. Simonton, University of Pennsylvania.  
William A. Simpson, University of Pennsylvania.  
Jonathan C. Simpson, Jefferson Medical College.  
John D. Singley, University of Pennsylvania.  
Harry W. Slack, West Penn Medical College.  
Julia Hayward Slack, Women's Medical College.  
Charles H. P. Slaughter, University of Pennsylvania.  
William H. Sloan, Medico-Chirurgical College.  
Alfred H. Smink, Jefferson Medical College.  
James S. Smith, Jefferson Medical College.  
Dennis K. Smith, University of Pennsylvania.  
L. B. R. Smith, University City New York.  
R. D. Snively, Medico-Chirurgical College.  
Abraham B. Snively, University of Pennsylvania.  
Elmer N. Souder, Jefferson Medical College.  
Grant Sparks, Medico-Chirurgical College.  
Raymond Spear, Jefferson Medical College.  
Anthony G. Sprissler, Medico-Chirurgical College.  
Eugene Stadleman, University of Pennsylvania.  
Max Staller, College of Physicians and Surgeons, Chicago.  
John T. Stanford, Howard University, Washington, D. C.  
Harry J. Stauffer, Jefferson Medical College.  
Albert C. Stephens, Medico-Chirurgical College.  
Thomas D. Stephens, West Penn Medical College.  
Lawrence H. Stepp, West Penn Medical College.  
Robert R. Stoner, University of Pennsylvania.  
Sina Stratton, Woman's Medical College.  
Samuel A. Sturm, West Penn Medical College.

Margaret K. Sullivan, Woman's Medical College.  
Mordecai A. Sutton, West Penn Medical College.  
Alonzo E. Taylor, University of Pennsylvania.  
Samuel B. Taylor, Jefferson Medical College.  
Robert L. Taylor, College of Physicians and Surgeons, Baltimore.  
George H. B. Terry, Jefferson Medical College.  
Thomas T. Thomas, University of Pennsylvania.  
Harry W. Tittle, West Penn Medical College.  
Leroy S. Townsend, West Penn Medical College.  
William T. Turner, University of Pennsylvania.  
Frank S. Van Kirk, University of Pennsylvania.  
George H. Vaux, West Penn Medical College.  
Charles A. Veith, University of Pennsylvania.  
George W. Wagner, Jefferson Medical College.  
Joseph D. Wallace, Medico-Chirurgical College.  
J. Frank Wallis, University of Pennsylvania.  
Thomas H. Walker, University of Pennsylvania.  
Frank A. Walsh, Jefferson Medical College.  
Joseph P. Walsh, University of Pennsylvania.  
James H. Ward, University of Pennsylvania.  
Robert H. Warnock, West Penn Medical College.  
Eugene Wasdin, Medical College of the State of South Carolina.  
Adam V. Walter, Jefferson Medical College.  
Harry W. Weyant, University of Pennsylvania.  
William H. Weber, West Penn Medical College.  
Nathan J. Weil, University of Pennsylvania.  
B. Frank Wentz, University of Pennsylvania.  
Silas G. Wertz, Jefferson Medical College.  
William W. Weygandt, Jefferson Medical College.  
John Wharn, Jr., Medico-Chirurgical College.  
Inman H. White, College of Physicians and Surgeons, Baltimore.  
Courtland Y. White, Jr., University of Pennsylvania.  
Harry G. Willson, University of Pennsylvania.  
Rachel R. Williams, Woman's Medical College.  
Joseph J. G. Williams, University of Pennsylvania.  
James Williamson, University of Pennsylvania.  
Thomas E. Wills, University of Pennsylvania.  
Thomas C. Wilson, Jefferson Medical College.  
James F. Wilson, University of Pennsylvania.  
Henry Wilson, West Penn Medical College.  
James Witherspoon, West Penn Medical College.  
Isaac R. Wolf, Jefferson Medical College.  
Julius Wolfson, Jefferson Medical College.  
George B. Wood, University of Pennsylvania.  
Fred. G. Wood, Jefferson Medical College.  
Edward H. Wood, College of Physicians and Surgeons, Baltimore.

Richard F. Woods, University of Pennsylvania.  
George Y. Woodland, Medico-Chirurgical College.  
Barton L. Wright, University of Pennsylvania.  
William Oscar Xander, University of Pennsylvania.  
Christian G. Yaeger, University of Pennsylvania.  
C. C. Yingling, West Penn Medical College.  
Charles E. Zerfing, University of Pennsylvania.  
William H. Zehner, Jefferson Medical College.

December, 1895.

William Cline Allen, University of the South.  
Cranville L. Agency, University of Pennsylvania.  
Walter Milton Babb, University of Pennsylvania.  
Henry Racas, Jefferson Medical College.  
Samuel D. Bickel, University of Pennsylvania.  
Arthur J. Bird, University of the South.  
William H. Boggs, Baltimore University.  
David C. Bradley, University of Pennsylvania.  
Daniel R. Brobst, Jefferson Medical College.  
Mary Clayton, Cooper Medical College, San Francisco.  
Benjamin F. Coe, College of Physicians and Surgeons, Baltimore,  
Md.  
Elton S. Corson, University of Pennsylvania.  
John K. Crawford, Jefferson Medical College.  
Walter L. Deemer, University of Baltimore.  
William B. Eaton, Berlin University.  
George W. Farquhar, University of Pennsylvania.  
Francis S. Ferris, University of Pennsylvania.  
S. Leon Gans, University of Pennsylvania.  
Mary B. Garvin, Woman's Medical College of Pennsylvania.  
Kivel Gojanski, University of Paris.  
Henry C. Haden, University of Pennsylvania.  
Aaron E. Hain, University of the South.  
William A. Hamilton, University of Pennsylvania.  
Ralph A. Harding, Columbian University, Washington.  
David A. Hootman, University of the South.  
William B. Kenworthy, University of Pennsylvania.  
Otto A. Koch, University of Pennsylvania.  
George W. Kugler, Jr., University of Pennsylvania.  
Margaret C. Lewis, Woman's Medical College of Pennsylvania.  
Jasmine McAlpine, Woman's Medical College.  
Thomas H. Mc Whorter, University of Pennsylvania.  
Walter Scott Macdonald, College of Physicians and Surgeons,  
Ontario.



M. E. Malaun, University of Pennsylvania.  
John Mellor, Medico-Chirurgical College.  
Lewis S. Mershon, University of the South.  
Will Warren Myer, University of Pennsylvania.  
Alice E. Palmer, Tuft's College Medical School, Boston.  
George B. Perry, University of Pennsylvania.  
Berthold S. Pollak, Dartmouth Medical College.  
Frederick K. Price, Jefferson Medical College.  
Francis G. S. Reese, University of Pennsylvania.  
Asa Holt Rogers, Jefferson Medical College.  
David Rose, Jefferson Medical College.  
John Gordon Ross, University of Pennsylvania.  
Lawrence H. Smith, College of Physicians and Surgeons, Baltimore, Md.  
Patrick T. Sullivan, Georgetown University, Washington.  
Robert H. Sykes, West Penn Medical College.  
James G. Taylor, University of Pennsylvania.  
Edward H. Varney, Medico-Chirurgical College.  
Mary G. Vowler, Woman's Medical College of Pennsylvania.  
H. C. White, Long Island College Hospital, Brooklyn.  
Emily G. Whitten, Woman's Medical College of Pennsylvania.  
John S. Woodruff, Medico-Chirurgical College.  
George N. Yagle, Jr., College of Physicians and Surgeons, Baltimore.

*Homoeopathic.*

Robert J. Abele, Hahnemann Medical College.  
Benjamin H. Bainbridge, Hahnemann Medical College.  
Mary Brewer, New York Medical College.  
William H. Bull, Perth Medical College, Ohio.  
George M. Conrad, Hahnemann Medical College.  
George M. Cooper, Hahnemann Medical College.  
Edwin G. Cowperthwait, Hahnemann Medical College.  
F. A. Davies, Chicago Homeopathic Medical College.  
John H. Davis, Cleveland University of Medicine and Surgery.  
Samuel A. Diefenderfer, Hahnemann Medical College.  
Louis M. Diemer, Hahnemann Medical College.  
Randal F. Ewing, Cleveland Medical College.  
John A. Fischer, Hahnemann Medical College.  
Albert W. Genert, Hahnemann Medical College.  
Hilton Hammond, Hahnemann Medical College of Illinois.  
Samuel B. Hanlin, Hahnemann Medical College.  
J. Eastwood Henshall, Hahnemann Medical College.  
Henry Hinshillwood, Hahnemann Medical College.

William B. Holcombe, Hahnemann Medical College.  
Sara Johnson, Boston University School of Medicine.  
Joseph V. Klock, Hahnemann Medical College.  
William H. Lytle, Hahnemann Medical College.  
Lewis E. McBride, Chicago Medical College.  
Albert C. Morrozi, Hahnemann Medical College.  
Gilbert J. Palen, Hahnemann Medical College.  
Theodore E. Perkins, Hahnemann Medical College.  
Roy Campbell Pitcairn, Hahnemann Medical College.  
Charles S. Raue, Hahnemann Medical College.  
Maitland W. Rendel, Hahnemann Medical College.  
B. Sankey, Cleveland Medical College.  
John R. Shetter, Hahnemann Medical College.  
John A. Shower, Southern Homeopathic Medical College, Baltimore.  
Nathan Smilie, Hahnemann Medical College.  
Deacon Steinmetz, Hahnemann Medical College.  
James Welch, Chicago Homeopathic Medical College.

*December, 1895.*

William Allen Barnes, Hahnemann Medical College.  
Duncan Campbell, Hahnemann Medical College.  
Alfred Cookman, Hahnemann Medical College.  
Edward Magee Deacon, Hahnemann Medical College.  
William C. Hunsicker, Hahnemann Medical College.  
W. D. Kinsloe, Hahnemann Medical College.

*Eclectic.*

Thomas O. Glenn, Eclectic Medical Institute, Cincinnati, Ohio.  
Thomas W. Wilson, Eclectic Medical Institute, Cincinnati, Ohio.  
Sullivan A. Gaskill, Baltimore Medical College.  
George A. Noon, Georgia College of Eclectic Medicine and Surgery.  
John Gross Secor, Medical Department University of Vermont.  
Licenses issued to persons holding certificates from other States:  
Charles E. Snyder, New York.  
Angeline Delphine Smith, New York.  
Abbie G. Hinckley, New York.  
Henry Halpert, New York.  
George F. Lazarus, New York.  
Edward Shepard Grigshy, New York.  
William John Kline Snyder, New York.  
Vincenzo Ciccone, New York.  
Henry W. Lattin, New York.  
Joseph Herbert Robison, New York.

Samuel Robinson Knight, New Jersey.  
James Whilldin Ware, New Jersey.  
Caroline Helen Van Horne, New Jersey.  
Max Friedlander, New York.  
Leo Fink Elstein, New Jersey.  
Noah Howard Burt, New Jersey.  
Marion Gifford, New Jersey.  
John Stewart Wade, New York.

# **APPENDIX O.**

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**METEOROLOGICAL OBSERVATIONS.**

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**PENNSYLVANIA STATE WEATHER SERVICE.**

## MONTHLY WEATHER REVIEW FOR JANUARY 1896.

Hall of the Franklin Institute,  
Philadelphia, January 31, 1896.

### General Review.

The average temperature for January, 1896, 27.6 is 0.5 below the average (28.1) for the past eight years.

The highest recorded temperatures occurred on the 29th and 30th, and were as follows: Chambersburg, 60; Shingle House, 60; Carlisle, 59; South Bethlehem, 59.

The lowest were on the 5th and 6th: Shingle House, minus 15; Dyberry, minus 13; Salem Corners, minus 12; Somerset, minus 11.

From January 1, 1896, to January 31, 1896, the accumulated deficiency in daily mean temperature at Philadelphia was 30; and excess at Pittsburgh, 24, and at Erie, 9.

For the same period the deficiency in precipitation, in inches, at Philadelphia was 1.80; at Pittsburgh, 1.48, and at Erie, 2.00.

### Temperature.

	Mean Temperature Degrees.	Mean Precipitation. Inches.
January, 1888, .....	22.1	4.19
1889, .....	31.9	3.54
1890, .....	37.7	3.04
1891, .....	30.6	3.64
1892, .....	26.3	4.77
1893, .....	19.3	3.85
1894, .....	32.7	2.29
1895, .....	24.2	4.17
1896, .....	27.6	1.43

The means of the daily maximum and minimum temperatures, 34.6 and 20.5 respectively, give a monthly mean of 27.6, which is 3.4 above the corresponding month of 1895.

The average daily range was 14.1. Highest monthly mean, 32.0 at Uniontown.

Lowest monthly mean, 19.2 at Dyberry. Highest temperature recorded during the month, 60, on the 30th, at Chambersburg and Shingle House. Lowest temperature, minus 15, on the 6th at Shingle House. Greatest local monthly range, 75 at Shingle House.

Least local monthly range, 44 at Erie. Greatest daily range, 44 at Altoona and Smethport.

### Precipitation.

The average precipitation for the State, for the month, 1.43 inches, is 2.18 less than the average (3.56) for the past eight years.

General precipitation occurred on the 9th, 19th, 20th, 23d and 24th.

The snowfall was light and very little remained on the ground at the end of the month.

The largest monthly totals of rainfall and melted snow in inches were: Shingle House, 2.40; Huntingdon, 2.27; Salem Corners, 2.19; Centre Hall, 2.18.

The least were: South Eaton, 0.52; Johnstown, 0.66; Gettysburg, 0.75; White Haven, 0.79.

### Wind and Weather.

The prevailing wind was from the West.

Average number: rainy days, 6; clear days, 8; fair days, 9; cloudy days, 14.

### Barometer.

The mean pressure for the month, 30.20, is about .10 above the normal. At the United States Weather Bureau Stations, the highest observed was 30.61 at Pittsburgh on the 15th, and the lowest, 29.61 at Pittsburgh on the 24th.

### Miscellaneous Phenomena.

Hail.—23d, 24th.

Snow.—1st, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 18th, 19th, 20th, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 31st.

Sleet.—18th 19th, 22d, 23d, 24th, 25th, 31st.

Coronae.—21st. Aurora.—3d.

Solar Halo.—13th, 17th, 22d, 31st.

Lunar Halo.—13th, 17th, 22d, 26th, 27th.

**MONTHLY SUMMARY OF REPORTS BY VOLUNTARY OBSERVERS OF THE PENNSYLVANIA STATE WEATHER SERVICE FOR JANUARY, 1896.**

Station.	Temperature.						Precipitation.				Number of days.				
	Elevation above sea level.			Minimum.		Mean of maximum.		Mean of minimum.		Total inches.	Total snowfall.	Snow on ground 31st.	Clear.	Fog.	Cloudy.
	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Greatest.	Daily Range.						
Wind, prevailing direction.															
Gettysburg.	28.8	56	30	6	35.3	22.2	13.1	29	0.75	1.0	3	13	7	11	NW
Pittsburgh.	842	31.0	56	4	37.0	27.0	12.0	30	1.63	0.7	10	5	10	16	W
Harrisburg.	389	23.2	40	6	34.7	23.8	10.9	28	0.80		4	1	23	7	E
Reading.	280	28.4									6				
Altoona (27 days).	1,181	37.2	69	6	41.9	26.5	17.5	44	0.87	1.5	4	11	1	19	W
Hollidaysburg.	947	26.2	58	30	6	36.3	20.2	16.1	3.5	1.81	11	4	5	22	SW
Le Roy.	1,460	21.8	40	29	6	27.8	15.7	12.1	24	2.00	6.3	1	7	13	W
Towanda.	754	23.7	46	29	6	30.0	17.4	12.6	35	0.84	5.9	5	11	7	NW
Fork of Nesquehany (30 days).	304	31.6							1.80	4.6	3	17	13		NW
Quakertown.	538	26.8	50	0	34.6	19.0	16.6	31	1.30	3.0	5	7	17	16	NW
Casandria.	2,100	29.1	60	30	4	31.1	14.7	10.0	24	2.10	11.0	1	4	17	NW
Emporium.	1,159	26.8	46	29	6	33.8	18.9	14.1	34	1.17	2.2	4	10	5	N
East Muncie, Chuk.	1,171	26.8	46	30	6	34.7	20.6	12.1	31	1.60	3.2	4	10	10	N
East Colicks.	455	24.2	52	30	4	32.5	23.0	12.5	27	1.87	2.0	5	15	9	W
West Chester.	380	26.8	57	30	4	37.2	20.5	16.7	26	1.38	2.7	5	18	6	W
O'Connell Square.	275	30.3	45	30	5	38.1	22.5	15.6	29	1.53	1.2	6	13	6	NE
Kennett Square.	350	29.3	45	30	6	35.2	23.4	11.8	24	1.45	0.5	3	4	7	NW
Wilmington (18 days).	1,470	24.2	51	30	6	35.1	18.9	10.5	30	1.22	6.5	10	2	12	E
Grampan.	760	27.6	50	30	1	35.1	20.0	15.1	34	1.30	4.0	4	7	5	W
Lock Haven.	1,200	24.8	46	29	30	35.4	22.8	12.6	30	1.72	2.0	4	14	5	SW
Sugarloaf.	490	29.1	59	30	6	35.4	22.8	12.6	30	1.72	2.0	4	14	5	W
Carlisle.	1,200	24.8	46	29	30	35.4	22.8	12.6	30	1.72	2.0	4	14	5	W
Harrisburg.	480	29.0	53	30	6	34.0	21.9	10.0	23	1.00		5	7	12	W
Middletown.	1,220	24.5	39	29	4	36.8	21.9	14.9	31	1.72	0.2	3	5	17	W
Edinboro.*	1,400	26.6	46	29	4	31.7	21.5	10.2	25	1.62	3.0	14	4	5	W
Erie.	681	32.0	54	17	29	1	1	1	25	1.62	1.0	13	10	6	SW
Uniontown.	1,040	28.4	60	30	3	36.2	20.6	15.6	31	1.10	0.2	3	11	5	W
Chambersburg.	600	28.4	60	30	3	36.2	20.6	15.6	31	1.10	0.2	3	11	5	W
Huntingdon (30 days).	600	28.6	56	30	3	37.0	22.1	14.9	36	2.27	4.7	6	11	13	W

Scranton, .....	21.3	45	23	-4	6	31.3	17.3	14.0	30	0.78	6.0	.....	5	6	12	13	13	W
Lancaster, (20 days), .....	413	29.9	56	30	9	5.	36.6	23.2	28	1.11	2.6	.....	6	9	8	14	3	W
Lebanon, .....	478	26.4	50	30	3	6	35.4	21.4	28	1.11	2.6	.....	6	9	8	14	3	W
Coopersburg, .....	520	30.6	53	21	1	6	40.0	21.2	35	1.13	2.6	.....	7	14	11	6	15	NW
Drifton (25 days), .....	1,683	21.0	40	28	-5	6	29.8	13.2	35	0.79	5.5	.....	4	1	23	7	8	W
White Haven, .....	1,250	23.4	47	18	-5	6	30.3	16.4	27	1.14	5.0	.....	3	8	15	17	W	W
Wilkes-Barre, .....	515	26.0	45	29	0	6	32.7	19.2	25	1.60	1.0	.....	6	11	3	17	W	W
Williamsport, .....	.....	27.1	45	30	1	6	32.8	21.4	44	1.60	8.0	.....	6	11	3	17	W	W
Smithport, .....	1,500	24.6	47	29	-6	6	31.2	17.9	32	1.97	1.0	.....	4	11	5	15	W	W
Pottstown, .....	1,160	29.4	54	30	4	6	35.5	23.4	32	1.97	1.0	.....	4	11	5	15	W	W
South Bethlehem,*1 .....	339	28.8	69	29	2	6	.....	.....	.....	.....	.....	.....	.....	14	8	9	.....	W
Easton, .....	335	28.6	47	30	-1	6	33.8	19.4	27	1.03	3.8	.....	6	11	7	13	.....	NW
Aquehuct Logania, .....	367	28.6	54	30	5	6	36.4	23.7	32	1.25	1.4	.....	6	11	7	13	.....	NW
Philadelphia, Weather Bureau, .....	117	31.1	53	30	4	6	36.6	23.6	20	1.37	.....	.....	6	10	10	11	.....	NW
Philadelphia, 129 Centennial avenue, .....	120	31.4	51	30	4	6	35.3	21.8	21	1.70	1.0	.....	6	10	10	11	.....	NW
Philadelphia, 44th Sanson street, .....	172	31.3	58	30	5	6	35.3	21.8	22	1.83	0.1	.....	6	10	14	7	.....	NW
Shingle House, .....	1,475	26.9	46	20	-15	6	45.6	16.2	32	0.80	11.0	T.	2	3	18	23	.....	NW
Shillington, .....	2,255	27.9	46	24	-11	6	34.7	19.1	28	0.90	.....	.....	2	3	18	23	.....	NW
Sumner, .....	2,267	27.3	50	30	-11	6	34.7	19.1	28	0.90	.....	.....	2	3	18	23	.....	NW
Warren, .....	1,327	23.6	42	29	-9	6	35.0	19.5	35	1.71	8.0	.....	12	1	13	17	.....	SW
Wilmington,*1 .....	1,470	27.9	49	29	-9	6	35.5	21.3	30	1.98	3.2	.....	7	9	3	22	.....	SW
Dyersburg, .....	1,190	19.2	43	29	-13	6	28.1	10.4	38	1.43	11.0	5.0	8	5	14	12	.....	SW
(Salem Corner) Hamilton, .....	1,670	22.3	50	18	12	6	29.8	14.8	34	2.19	14.5	3.0	9	5	7	19	.....	W
(Hemel Reservoir) Lyellpus, .....	1,420	26.8	49	18	-2	6	35.2	23.4	29	1.59	2.1	.....	9	.....	.....	.....	.....	W
South Easton, .....	1,680	24.1	45	29	-4	6	31.6	16.7	30	0.52	5.0	.....	4	9	9	13	.....	NW
York, .....	365	23.5	58	29	-5	6	36.2	23.8	27	0.94	1.0	.....	5	11	8	12	.....	W

Mean temperature from maximum and minimum readings.

1 Mean temperature from 7, 8 and 9 readings.

\* Extremes from dry thermometers.

2 Mean temperature from 8 and 9 readings.



## PRECIPITATION DURING, 1896.

	1	2	3	4	5	6	7	8	9	10	14
<b>Delaware Basin</b>											
Philadelphia									.05		
Brown's Neck									.10		
Croftsville									.01		
Croftsville							.02		.05		
Dyersville											
Dyersville			.05	.04			.11		.33		
Finney							.08		.10		
Point of Neversink									.07		
Frederick									.05		
Hamburg									.04		
Kennett Square							.02		.04		
Lansdale									.06		
Mechanic							.05		.12		
Myrtle											
Philadelphia, Pa.								.01	.01		
Philadelphia, Pa.							.01		.02		
Philadelphia, Pa.							.01		.02		
Philadelphia, Pa.							.02		.05		
Point Pleasant									.05		
Pottstown									.10		
Quakertown									.02		
Reading	.01								.02		
Salem Corner							.01	.10	.25	.15	
Philadelphia		.15									
Smith's Corner									.09		
Swatara									.09		
West Chester											
Wilmington									.03		
White Haven							.06		.30		
<b>Susquehanna Basin</b>											
Albany									.07		
Aqueduct			.01						.03		
Carlisle											
Centre Hall							.05				
Emporium									.08		
Gottsburg											
Gottsburg				.01				.04	.26		
Gottsville							.05		.12		
Grampian			.15								
Harrisburg									.07		
Harrisburg	.04								.33		
Harrisburg									.02		
Harrisburg									.10		
Lebanon				.01			.08	.04		.01	



## PRECIPITATION DURING JANUARY, 1896.—Continued.

	15	18	19	20	23	24	25	26	27	31	Total.
<b>Delaware Basin.</b>											
Bethlehem, .....			.14			1.04					1.28
Prower's Lock, .....				.16		1.01					1.27
Coatesville, .....			.20	.03	.10	.53					1.36
Coopersburg, .....			.13	.05	.01	.86	.01				1.13
Doylstown, .....			.17			.86					1.03
Dyersburg, .....			.19	.04		.80	.04				1.49
Easton, .....			.20			.81				.04	1.03
Forks of Susquehanna, .....			.15			1.37					1.50
Fredrick, .....			.08	.01	.05	.61					0.53
Hamburg, .....			.15	.16	.12	.45					0.90
Kennett Square, .....			.19	.05	.12	1.10	.02				1.52
Lansdale, .....			.14	.05	.02	.51					1.11
Mauch Chunk, .....			.13			1.54					1.80
Ottsville, .....			.14	.10		.63					0.37
Philadelphia, Pa., .....			.12	.04	.04	1.35					1.57
Philadelphia, N. J., .....			.10	.04	.03	1.50					1.70
Philadelphia, West, .....			.11	.03	.14	1.52					1.83
Point Pleasant, .....			.04	.12	.36	.69					1.22
Pottstown, .....			.22		.20	1.50					1.97
Quakertown, .....			.09	.03		1.01	.02				1.30
Reading, .....			.10	.04	.12	.79					1.03
Salem Corners, .....			.20	.10		1.04	.10				2.19
Scholarville, .....			.11	.02	.02	.85					1.09
Smith's Corner, .....			.09	.05		1.00				.25	1.23
Swarthmore, .....		.02			1.45						1.72
West Chester, .....			.15	.03		1.36					1.57
Westtown, .....			.13		.06	1.34					1.43
White Haven, .....						.25					0.19
<b>Susquehanna Basin.</b>											
Albany, .....			.03		.26	.51					0.87
Amherst, .....			.20	.02	.20	.70					1.12
Carlisle, .....			.20	.19	.20	1.03					1.72
Centre Hall, .....					1.55					.48	2.18
Emporium, .....	.10					.45					0.75
Galtysburg, .....	.04		.20		.34	.30					0.75
Girardville, .....			.11		.23	.29				.18	1.29
Gramplan, .....			.35		.23	.53					1.23
Harrisburg, .....			.15		.10	.52	.08				1.01
Harrisburg †, .....			.10	.01	.20	.68	.01				1.01
Holidaysburg, .....			.09	.03	.35	1.19				.04	1.01

Huntingdon.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											</
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**\* Amount included in measurement following.**

†U. S. Weather Bureau Stations.

## MONTHLY REVIEW.

## Philadelphia, Pa., February, 1896

The average temperature for February, 1896, 29.4 degrees, is 0.6 degrees below the average (28.8 degrees) for the past eight years.

The highest recorded temperature occurred on the 27th and 28th and were as follows: Pittsburg, 65 degrees; Erie, 63 degrees, and Uniontown, 63 degrees.

The lowest were on the 17th: Salem Corners, minus 21 degrees; Blooming Grove, minus 20 degrees; White Haven, minus 20 degrees, and Honesdale, minus 20 degrees

From January 1, 1896 to February 29, 1896, the accumulated deficiency in daily mean temperature at Philadelphia was 21 degrees; at Erie, 12 degrees, and at Pittsburg, 12 degrees.

For the same period the excess in precipitation, in inches, at Philadelphia, was 1.73; and deficiency at Erie, 1.55, and at Pittsburg, 1.55.

## Temperature.

	Mean temperature.	Mean precipitation. Inches.
February 1888, .....	22.4	2.50
1889, .....	23.0	1.96
1890, .....	37.1	4.32
1891, .....	34.9	4.61
1892, .....	31.7	1.75
1893, .....	27.4	5.92
1894, .....	27.6	3.53
1895, .....	20.2	1.22
1896, .....	29.4	4.90

The means of the daily maximum and minimum temperatures, 37.3 degrees, and 21.5 degrees, respectively, give a monthly mean of 29.4 degrees, which is 9.2 degrees above the corresponding month of 1895.

The average daily range was 15.8 degrees.

Highest monthly mean, 34.4 degrees, at Philadelphia (Centennial Avenue).

Lowest monthly mean, 22.8 degrees, at LeRoy and Dyberry.

Highest temperature recorded during the month, 65 degrees, on the 27th, at Pittsburg.

Lowest temperature, minus 21 degrees, on the 17th, at Salem Corners.

Greatest local monthly range, 75 degrees, at Saegerstown.

Least local monthly range, 54 degree, at Acqueduct (Logania).

Greatest daily range, 46 degrees, at Smethport and York.

## Precipitation.

The average precipitation for the State for the month, 4.90 inches, is 1.67 inches more than the average (3.23 inches) for the past eight years.

General precipitation (mostly in the form of snow) occurred on the 1st, 3d, 6th, 9th, 13th, 19th, 26th and 29th. On the 6th the precipitation was excessive at nearly all the stations in the Delaware Basin. Very little snow remained on the ground at the end of the month.

The largest monthly totals of snowfall in inches were: Salem Corners, 20.5; Cassandria, 20.0; Dyberry, 20.0; Wilkes-Barre, 19.0.

The largest monthly totals of rainfall and melted snow in inches were: Forks of Neshaminy, 9.08; Point Pleasant, 8.75; Smith's Corner, 8.13; Blooming Grove, 7.97; Doylestown, 7.47, and Ottsville, 7.41.

The least were: Altoona, 1.94; Elwood Junction, 2.13; Beaver Dam, 2.44; Lock No. 4, 2.07.

## Wind and Weather.

The prevailing wind was from the west.

Average number: rainy days, 11; clear days, 9; fair days, 7; cloudy days, 13.

## Barometer.

The mean pressure for the month, 29.94, is about .16 below the normal. At the United States Weather Bureau Stations, the highest observed was 30.64, at Erie on the 17th, and the lowest, 28.70, at Harrisburg on the 6th.

## Miscellaneous Phenomena.

Thunderstorms.—6th, 14th, 28th, 29th.

Sleet.—1st, 3d, 4th, 9th, 13th.

Solar Halo.—8th, 17th, 19th, 20th.

Hail.—1st, 3d, 4th, 13th, 26th.

Aurora.—14th, at LeRoy.

Lunar Halo.—20th, 22d, 24th.

## MONTHLY SUMMARY OF REPORTS by Voluntary Observers of the Pennsylvania Climate and Crop Service for February, 1896.

Station.	Elevation above sea level.	Temperature.				Precipitation.				Number of days.			Wind, prevailing direction.		
		Maximum.		Minimum.		Mean of maximum.	Mean of minimum.	Daily Range.	Total inches.	Total snowfall.	Snow on ground 31st.	Clear.		Fair.	Cloudy.
		Highest.	Date.	Lowest.	Date.										
Gettysburg.	311.5	57	17	2	17	38.5	24.5	14.0	31	3.71	8.0	13	8	8	NW
Pittsburg.	842	32.3	65	17	17	40.0	25.0	15.0	35	2.89	6.7	16	3	10	SW
Hamburg.	380	30.7	56	5	17	37.3	21.1	13.2	30	4.68	9.0	10	3	16	NW
Reading.	260	31.2							30	4.88		15			NW
Altoona (28 days).	1,181	34.6	57	1	17	44.1	25.0	19.1	35	1.91		8			NW
Hollidaysburg.	947	31.8	58	2	17	40.6	22.9	17.7	35	3.70	8.5	11	2	16	SW
Le Roy.	1,400	22.8	49	28	17	30.4	15.3	15.1	36	4.66	15.7	10	5	6	W
Towanda.	754	21.8	50	15	17	32.6	18.9	13.7	38	3.96	14.5	10	8	13	W
Forks of Nesheimny.*	344	36.2							30	9.08		11	18	0	N
Quakertown.	528	29.0	57	6	17	36.6	21.4	15.2	30	7.41	15.5	10	7	11	NW
Cassandria.	2,100	28.8	56	8	17	34.9	22.6	12.3	35	4.38	20.0	16	2	9	NW
Emporium.	1,050	27.2	56	28	17	35.6	18.8	16.8	37	3.68	17.5	11	7	15	W
East Mauch Chunk.	550	27.9	74	6	10	35.1	20.7	14.4	32	7.16	16.8	12	14	3	N
State College.	1,191	28.2	52	8	17	36.0	20.4	15.6	36	4.10	12.0	10	6	17	W
West Chester.	455	22.2	57	23	3	40.3	24.1	16.2	29	6.77	4.0	12	14	2	W
Coatesville.	390	32.4	60	23	0	41.6	23.3	18.3	38	6.54	7.3	11	13	6	W
Kennett Square.	275	33.2	58	21	17	42.1	24.6	15.5	30	7.21	3.7	9	2	11	NW
Westtown.	350	32.4	55	21	17	40.1	24.6	15.5	30	7.21	3.7	9	2	11	NW
Grampian.	1,450	24.8	50	28	12	30.9	19.8	12.1	32	3.57	14.0	10	14	3	W
Lock Haven.	1,600	30.3	55	29	5	38.4	22.2	16.2	31	5.28	14.5	10	14	3	W
Sacketstown.	1,200	27.3	60	28	16	36.8	17.8	19.0	42	4.10	14.2	14	4	5	SW
Carlisle.	480	31.1	56	15	17	38.5	21.7	14.8	34	6.41	13.5	11	12	7	SW
Harrisburg.	480	31.0	54	15	17	37.0	25.0	12.0	24	5.48	10.0	11	5	12	W
Swarthmore.	190	32.4	62	6	2	40.6	24.1	16.5	42	6.62	1.2	8	9	10	W
F. F. Imbrie.*†	1,250	24.2	50	28	14	35.0	20.0	15.0	32	3.97		19			W
Erie.	1,400	27.5	63	28	17	35.0	20.0	15.0	32	3.97		19			W
Uniontown.	681	31.5	63	28	17	35.0	20.0	15.0	32	3.97		13	7	11	SW
Chambersburg.	1,040	31.5	58	27	15	34.7	24.7	16.7	35	2.81	0.2	10	10	2	SW

Huntingdon (27 days),	570	21.4	56	21	0	17	39.7	33.2	16.5	33	3.18	9.3	.....	10	7	4	16	W	
Scranton,	741	28.8	52	28	14	17	34.4	19.2	16.2	32	4.91	11.5	.....	11	6	5	18	W	
Lancaster,	413	30.8	57	6	24	17	38.5	21.0	15.5	31	3.60	5.0	.....	11	11	9	9	W	
Lebanon,	458	30.6	57	16	-2	17	38.0	23.2	14.8	30	6.31	10.4	.....	15	10	8	11	NE	
Coopersburg,	539	32.4	59	16	-4	17	41.5	23.3	18.2	34	6.98	8.5	.....	14	16	3	10	NW	
Drifton (25 days),	1,683	24.5	51	7	-15	17	34.0	15.0	19.0	33	3.14	19.3	.....	13	4	7	11	NW	
White Haven (26 days),	1,270	24.6	53	6	-21	17	32.7	18.6	16.2	33	4.25	13.3	.....	12	4	15	10	NW	
Wilkes-Barre,	575	29.4	56	29	-7	17	32.8	20.6	17.6	41	6.17	19.0	.....	10	12	6	11	W	
Williamsport,	284.0	29.4	56	16	-4	17	34.1	17.8	12.3	30	3.81	17.5	.....	7	11	6	13	E	
Gettysburg,	1,400	24.7	57	28	-16	18	33.1	17.3	14.8	46	3.65	17.5	.....	8	17	6	17	NW	
South Bethlehem,*†	325	32.5	62	6	-6	17	39.5	25.5	14.0	28	7.08	3.2	.....	9	17	4	8	W	
Easton,*	325	32.9	57	6	-8	17	37.6	22.3	15.4	38	6.24	8.8	.....	15	8	9	W		
Aqueduct Logania,	387	32.0	54	15	24	17	38.9	25.2	13.7	39	5.67	8.3	.....	12	9	10	10	NW	
Philadelphia, Weather Bureau,	117	33.6	60	28	-2	17	41.5	25.7	15.8	26	6.87	4.0	.....	13	0	8	11	W	
Philadelphia, 1629 (Centennial Avenue),	120	31.4	60	6	28	17	42.6	26.1	16.5	29	6.99	4.0	.....	13	9	11	9	W	
Bloomington Grove,	23.0	33.0	47	24	-21	17	31.8	14.3	17.5	33	7.97	16.8	4.0	.....	11	6	7	16	NW
Shingle House,	1,475	28.1	58	1, 59	-16	18	34.6	17.8	17.0	44	3.38	17.0	1.0	.....	9	4	5	20	NW
Selling Grove,	465	28.4	58	38	-4	17	35.9	21.0	14.9	30	5.71	16.5	.....	10	0	19	10	NW	
Summerset,	2,250	28.2	58	18	-7	20	6.8	19.6	17.2	41	4.24	11.8	.....	13	0	8	21	SW	
Weilshorn,*†	1,327	24.5	54	28	-14	17	39.0	21.1	17.9	33	4.46	16.0	T	.....	8	6	6	17	W
Lewistown,	450	30.0	51	15	-3	17	39.0	21.1	17.9	33	4.46	16.0	.....	9	9	4	16	W	
Dyersburg,	1,100	22.8	47	28	-19	17	31.1	14.6	16.5	39	5.10	20.0	4.0	.....	12	5	10	14	NW
Honesdale,	1,000	16.7	50	1, 22	-20	17	37.8	17.6	18.2	44	4.78	3.8	3.0	.....	9	9	9	9	N
(Salem Corners) Hamilton,	1,600	24.3	50	15, 28	-21	17	31.6	17.0	14.6	39	7.11	20.5	4.0	.....	15	3	13	14	W
(Immel Reservoir) Lyellville,	1,420	28.7	62	29	-5	17	38.3	21.1	17.2	34	3.07	9.8	.....	16	.....	.....	.....	.....	
South Eaton,	660	27.4	51	28	-13	17	35.7	19.2	16.5	35	4.11	9.5	.....	9	6	7	16	NW	
York,	385	32.6	58	15	1	17	39.6	25.6	14.0	46	4.88	9.3	.....	11	12	7	10	W	

\* Extremes from dry thermometers

† Mean temperature from 3 and 5 readings.

Mean temperature from maximum and minimum readings.

1 Mean temperature from 1, 2, 9 and 9 readings.



## PRECIPITATION DURING FEBRUARY, 1896.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Delaware Basin.													
Bethlehem.	.36			.50		2.34			.67				.50
Blooming Grove.	.55		.40	.25		2.31			.45				.34
Flower's Lock.	.32		.32	.28	.02	2.01			.57		.10		.47
Coatesville.	.33		.34	.28		3.00			.50				.60
Coopersburg.	.34	.01	.32	.23	.01	3.47	.01		.68				.64
Doylesstown.	.37		.30	.17		4.46			.44				.51
Dyberry.	.37		.28	.17	.25	2.08	.18		.59				.23
Faston.	.27				.39	3.74			.65				.59
Falls of Neshaminy.	.24			.55		5.46	.04		.68				.58
Frederick.	.30		.31	.22		3.20			.53				.53
Hamburg.	.30		.30	.31		1.65			.80				.68
Honesdale.	.65		.30	.05		2.02			.48				.68
Kennett Square.	.21		.23	.20	.01	3.46			.53		.10	.37	.57
Lansdale.	.24		.32	.20		4.33			.68				.47
East Mauch Chunk.	.55		.36	.31	.03	2.66	.50		.90				.64
Ortville.	.38		.39	.29	.05	3.60	.78		.67				.67
Philadelphia.	.27		.33	.08		3.86			.30				.61
Philadelphia, Y.	.26		.31	.14		3.81			.40				.80
Pratt Furnace.			.79	.30	.03	4.79			.58				.70
Portstown.	.25		.75	.20		3.40			.71				.89
Reading.	.36		.36		.30	4.11			.58				.70
Readingtown.	.18		.60	.02		1.83	.02		.57		.01		.53
Salmon Corners.	.45	.20	.10	.40	.30	2.10	1.15		.50	.05			.53
Schokville.	.26		.24	.30	.01	2.34	.01		.68				.56
Smith's Corner.	.23		.42	.29		4.54			.50				.58
Swarthmore.	.27			.10		4.00			.25				.46
West Chester.	.37		.28			3.88			.43				.62
Westtown.	.25			.37		4.58			.46				.82
White Haven.	.23		.30			1.40	.32		.45				.23
Susquehanna Basin.													
Altoona.	.13		.10	.05		.70			.22				.33
Aqueduct.	.22		.30	.50	2.38				.70				.28
Carlisle.	.25		.40	.60	.10	2.90		.15	.43				.39
Drifton.	.20		.30	.20	.30				.70	.15			.35
Emporium.	.46		.21	.25		1.05			.38				.70
Gettysburg.	.16		.28	.02	.12			.12	.38				.23
Girardville.	.29		.28	.12		3.61			.53				.20
Granplan.	.50		.45	.51		.38			.40	.70			.62
Harrisburg.	.16		.21	.50	.10	2.38			.41				.36
Holidaysburg.	.16		.32	.13	.04	.34		.17	.41				.36
Huntingdon.	.27		.13	.10		1.00			.30				.54
Lancaster.	.15		.45	.40					.30		.01		.54
Lebanon.	.22		.27	.14	.01	3.05		.01	.47				.64
Le Roy.	.15		.12	.15		1.52	.70		.60				.68



## PRECIPITATION FOR FEBRUARY, 1896—Continued.

Delaware Basin.														Total.
14	15	16	18	19	20	23	24	25	26	28	29	30	31	
Bethlehem.										.06		.99	6.18	
Blooming Grove.										.25		2.10	7.97	
Brower's Lock.												.82	6.65	
Coatesville.	.13			.09								.81	6.54	
Coopersburg.				.10						.05		.92	6.38	
Doylstown.				.05						.05		1.11	7.47	
Dyberry.										.11		.49	5.10	
Easton.	.16			.03						.02		.85	6.24	
Falls of Neshaminy.				.02						.03		1.38	9.03	
Frederick.				.09								.53	5.33	
Hamburg.										.15		.36	4.68	
Honesdale.												.48	7.9	
Kennett Square.	.02			.13						.02		.22	8.43	
Lansdale.	.03			.04						.02		.38	6.81	
East Mauch Chunk.				.20						.10		1.24	7.16	
Ortville.				.07						.05		.96	7.41	
Philadelphia. †	.04			.01						.01		.21	1.03	
Philadelphia. ‡	.01			.05						.01		.27	8.29	
Point Pleasant.	.03			.03						.04		.39	1.17	
Pottstown.				.08								.30	1.90	
Quakertown.				.13						.10		.78	7.98	
Reading.				.02						.02		.14	4.48	
Salem Corner.	.24			.02		.15				.20		.32	7.11	
Sheltonville.	.03			.06						.04		.12	8.3	
Swarth's Corner.										.04		.12	6.11	
Swarth's.										.06		.14	8.13	
West Chester.				.02						.02		.21	6.32	
Westtown.	.02			.03						.01		.58	7.21	
Whie Haven.				.02		.10				.20		.41	4.25	
Susquehanna Basin.														
Altoona.	.23											.28	1.91	
Aqueduct.										.04		1.60	5.65	
Carlisle.				.08						.04		1.55	6.41	
Drifton.				.03		.20		.10				.41	3.14	
Emporium.				.15		.03		.02		.08			3.68	
Gettysburg.												1.28	3.71	
Girardville.				.18		.05				.11		.60	6.40	
Gramplan.				.12						.04			3.57	
Harrisburg. †	.02			.25						.05		.10	1.33	
Hollidaysburg.										.07		.56	5.48	
Huntingdon.				.06						.05		.42	3.16	
Lancaster.												.90	3.60	
Lebanon.	.05			.01		.01				.05		.13	8.31	
Le Roy.				.10						.30			4.95	

Lawsburg.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Amount included in measurement following.

**U. S. Weather Bureau Stations.**

## MARCH.

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The month of March was a typical one, being unusually cold, stormy, and windy. Considerable snow fell, but generally without much drift; consequently there was but little interruption to travel. Very little snow was left on the ground at the end of the month. During March the office at Philadelphia received two cold-wave orders, two special storm warnings, and three snow warnings.

### Atmospheric Pressure.

The mean pressure for the month, 30.60 inches, is about 0.04 inch above the normal. At the United States Weather Bureau stations the highest observed was 30.64 inches, at Philadelphia and Harrisburg on the 14th, and the lowest, 29.09 inches, at Philadelphia on the 11th.

### Temperature.

The average temperature for March, 30.6 degrees, is 4.5 degrees below the average.

The highest recorded temperatures occurred on the 29th and 30th, and were as follows: Carlisle and Lock Haven, 69 degrees; Pittsburg Coatesville, Huntingdon, Uniontown, Selinsgrove, and York, 68 degrees.

The lowest temperatures were on the 13th, 14th, and 21st, and were as follows: Dyberry, minus 18 degrees; Honesdale, minus 16 degrees; Lewisburg, minus 14 degrees; White Haven, minus 13 degrees; Towanda, minus 12 degrees.

The means of the daily maximum and minimum temperatures of the various stations, 40.3 degrees and 21 degrees, respectively, give a monthly mean of 30.6 degrees, which is 3.2 degrees below the corresponding month of 1895.

The average daily range was 19.3 degrees.

The highest monthly mean was 36.4 degrees, at Philadelphia.

The lowest monthly mean was 20 degrees, at Dyberry.

The highest temperature recorded during the month was 69 degrees, on the 30th at Carlisle and Lock Haven.

The lowest temperature was minus 18 degrees, on the 14th at Dyberry.

The greatest local monthly range was 81 degrees, at Lewisburg and Honesdale.

The least monthly local range was 48 degrees, at Philadelphia.

The greatest daily range was 51 degrees, at Somerset.





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## Precipitation.

The average precipitation for the month, 4.51 inches, is 1.26 inches in excess of the average.

The largest totals of rainfall and melted snow, in inches, were: Blooming Grove, 7.98; East Mauch Chunk, 6.95; Point Pleasant, 6.55; Wilkes-Barre, 6.31; Honesdale, 6.08; Girardville, 6.00. The least were: Altoona, 1.77; Brookville, 2.47; Shingle House, 2.70; State College, 2.82.

The heaviest snow falls, in inches were: Cassandria, 40.0; Somerset, 37.0; Uniontown, 36.5; Blooming Grove, 32.8; Hollidaysburg, 32.5, and Honesdale, 31.0.

## Wind and Weather.

The prevailing wind was from the northwest and west.

Average number of rainy days, 11; clear, 11; partly cloudy, 8; cloudy, 12.

## Miscellaneous Phenomena.

Thunderstorms.—Smethport and Shawmont, 7th; Saegerstown, 6th, 29th, 31st; Blooming Grove, 19th; Hollidaysburg, 26th; Honesdale, 19th; Salem Corners, 26th, 27th; Somerset, 26th; Uniontown 26th.

Auroras.—Coatesville, Aqueduct, Williamsport, and State College, 4th; Le Roy, 4th, 13th, 14th; Somerset, 25th.

Solar Halos.—Wellsboro, 18th, 31st; Le Roy, 18th, 25th, 31st; Philadelphia (Centennial Avenue), 6th, 18th, 26th, 31st.

Lunar Halos.—West Chester, 21st; State College, 21st, 26th, 27th; Carlisle, 25th.



Lancaster.	413	8	33	3	62	31	4	14	28	4	9	13	10	8	NW										
Lebanon.	458	8	33	3	62	31	4	14	28	4	9	13	10	8	NW										
Lehigh.	320	6	34	1	6	67	30	8	14	35	5	13	10	8	NW										
Coopersburg.	1,250	6	37	5	62	31	13	13	35	5	13	10	8	NW											
White Haven.	575	6	31	1	67	30	5	14	31	6	11	10	8	NW											
Laurens.	575	6	31	1	67	30	5	14	31	6	11	10	8	NW											
Williamsport.	575	6	31	1	67	30	5	14	31	6	11	10	8	NW											
Lycoming.	1,500	4	26	0	6	65	31	7	13	42	4	23	10	11	8	NW									
McKean.	1,000	5	34	3	66	30	4	13	28	5	39	3	9	7	NW										
Merer.	150	8	34	3	66	30	4	13	28	5	39	3	9	7	NW										
Gettysburg.	329	19	36	7	65	29	6	12	35	5	32	2	31	5	11	NW									
South Bethlehem.	325	12	31	0	61	31	2	14	36	3	39	0	64	1	14	NW									
Easton.	307	7	33	8	61	30	4	13	36	4	38	4	38	13	15	6	11	NW							
Apquett.	117	25	35	8	63	26	15	24	31	4	11	0	104	9	0	14	5	12	NW						
Ph Indlephla.	129	5	36	1	63	26	15	24	31	4	11	0	104	9	0	14	5	12	NW						
125 Centennial avenue.	129	5	36	1	63	26	15	24	31	4	11	0	104	9	0	14	5	12	NW						
Blomington Grove.	8	24	2	7	57	30	8	14	43	7	98	4	16	3	37	32	8	11	6	10	15	NW			
Pike.	1,475	8	24	2	7	57	30	8	14	43	7	98	4	16	3	37	32	8	11	6	10	15	NW		
Potter.	435	7	30	6	68	30	8	13	43	2	70	4	104	0	0	69	9	90	28	0	9	4	21	6	NW
Snyder.	2,250	8	30	8	68	30	8	13	43	2	70	4	104	0	0	69	9	90	28	0	9	4	21	6	NW
Somersed.	1,327	8	30	8	68	30	8	13	43	2	70	4	104	0	0	69	9	90	28	0	9	4	21	6	NW
Wellsborg.	1,327	8	30	8	68	30	8	13	43	2	70	4	104	0	0	69	9	90	28	0	9	4	21	6	NW
Tioga.	1,327	8	30	8	68	30	8	13	43	2	70	4	104	0	0	69	9	90	28	0	9	4	21	6	NW
Union.	1,327	8	30	8	68	30	8	13	43	2	70	4	104	0	0	69	9	90	28	0	9	4	21	6	NW
Waverly.	1,327	8	30	8	68	30	8	13	43	2	70	4	104	0	0	69	9	90	28	0	9	4	21	6	NW
Waxme.	1,000	17	28	0	67	31	18	11	47	6	58	3	35	5	98	2	09	1	44	28	8	6	10	15	NW
Hamilton.	1,600	17	28	0	67	31	18	11	47	6	58	3	35	5	98	2	09	1	44	28	8	6	10	15	NW
Lyndup.	1,290	3	30	8	67	30	6	24	32	4	17	1	289	0	0	69	9	90	28	0	9	4	21	6	NW
Westmoreland.	1,600	17	28	0	67	31	18	11	47	6	58	3	35	5	98	2	09	1	44	28	8	6	10	15	NW
Northampton.	1,290	3	30	8	67	30	6	24	32	4	17	1	289	0	0	69	9	90	28	0	9	4	21	6	NW
South Eaton.	600	6	28	6	4	7	64	30	6	14	36	4	45	1	29	0	1	41	22	5	12	13	11	8	NW
York.	385	8	33	4	68	30	6	13	38	4	20	1	68	0	99	23	5	12	13	11	8	3	11	8	NW

• Extremes of temperature from observed readings of dry thermometers.

1 Mean of 7 a. m. + 2 p. m. + 9 p. m. ÷ 4.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers. A roman letter following the name of a station, or placed against the data in the body of the form, indicates the number of days missing from the record; for instance, "II" denotes 11 days missing.

## Maximum and Minimum Temperatures for Pennsylvania, March, 1896.

Stations.	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona, .....	47	35	41	27	33	17	33	14	35	19	52	29	54	39	43	30	37	41	31	28
Aqueduct, .....	47	38	36	23	38	22	37	19	46	5	48	24	55	39	41	30	41	31	35	40
Blooming Grove, .....	35	23	27	15	21	7	19	4	33	5	43	11	42	27	39	19	33	15	30	13
Carlisle, .....	47	36	37	28	40	21	38	19	46	19	47	26	48	30	32	26	35	25	33	30
Cassandria, .....	34	32	25	21	24	14	26	12	34	9	53	43	53	34	38	33	40	28	33	29
Center Hall, .....	38	31	32	22	32	13	12	10	40	10	48	21	45	29	32	24	37	35	31	32
Chambersburg, .....	47	36	37	29	37	32	40	19	45	19	48	21	53	32	29	28	43	28	34	38
Coatesville, .....	42	38	38	26	39	23	40	20	47	18	51	24	50	34	42	33	44	26	40	30
Coopersburg, .....	42	38	35	26	36	16	19	42	51	16	54	23	55	34	31	30	45	25	38	28
Dyersburg, .....	35	30	24	17	21	11	24	8	29	9	44	12	45	31	31	24	30	20	28	18
Easton, .....	51	38	39	26	29	18	28	13	38	18	47	23	49	35	41	30	38	26	37	27
Emporium, .....	37	31	31	20	28	14	28	13	40	9	48	18	41	29	31	27	35	22	24	24
Erie, .....	35	24	28	17	26	14	25	12	28	12	48	20	37	28	28	23	31	20	27	35
Gettysburg, .....	32	26	24	20	22	16	16	8	28	16	32	22	36	28	30	24	30	22	32	24
Greampian, .....	43	37	34	30	33	19	33	16	42	16	50	17	51	34	39	31	42	26	32	27
Greenville, .....	35	31	22	16	21	9	20	6	30	8	48	13	43	29	31	22	32	20	32	18
Hamburg, .....	46	38	33	28	38	20	36	19	46	19	46	29	50	35	37	32	40	29	33	28
Harrisburg, .....	43	31	34	24	35	15	35	12	45	11	48	20	45	30	38	28	42	25	38	24
Holidaysburg, .....	40	36	28	24	35	15	25	12	34	12	47	17	44	33	34	27	34	23	35	24
Honesdale, .....	42	34	36	28	37	19	36	16	47	16	48	25	48	33	37	30	40	27	37	27
Huntingdon, .....	51	38	43	29	37	21	39	18	45	18	49	23	54	31	43	32	44	25	41	30
Kennett Squar, .....	45	35	39	27	37	19	37	15	44	16	48	23	54	31	43	32	44	25	41	30
Lancaster, .....	46	36	39	28	37	18	38	18	44	17	49	22	52	34	40	29	42	20	38	20
Lebanon, .....	33	29	22	14	18	8	20	6	28	6	40	15	41	27	31	21	30	18	28	17
Lewistown, .....	45	34	30	25	36	19	37	16	44	15	48	23	52	34	40	29	42	20	38	20
Lock Haven, .....	45	35	37	27	37	7	35	24	60	12	52	20	44	34	37	30	42	24	36	26
Lycing, .....	42	29	32	22	26	13	32	11	38	3	48	16	57	37	40	26	50	24	31	25
Mary's Church, .....	40	37	30	25	29	17	32	15	38	15	50	22	50	35	37	31	39	25	37	30
Philadelphia (a), .....	51	39	39	26	36	20	36	20	44	18	48	28	55	35	42	31	43	28	37	31
Philadelphia (b), .....	52	42	42	29	37	21	38	20	44	18	47	26	54	36	42	31	45	27	37	31
Pittsburgh, .....	35	29	30	24	31	16	32	14	40	13	57	26	52	35	40	28	40	20	29	20
Pottstown, .....	44	38	35	25	36	18	36	18	44	18	49	26	52	35	40	32	44	28	39	28
Quakertown, .....	43	36	34	28	32	17	34	16	42	15	50	18	53	32	40	29	43	24	35	24
Reading, .....	35	25	29	19	26	10	24	8	39	5	43	17	47	25	30	20	35	15	34	20
Scranton, .....	39	33	35	22	25	14	23	11	13	12	45	25	48	35	39	27	35	24	32	23

Selling Grove.	37	33	28	22	23	13	22	12	31	12	40	20	40	33	30	28	28	48	35	42	27
Shingle House.	47	34	45	27	43	13	35	16	28	14	48	10	50	27	32	28	28	30	18	42	17
Smethport.	38	28	33	18	20	9	13	9	22	14	47	16	40	28	28	28	28	32	19	22	14
Somerset.	33	25	34	18	20	9	13	9	22	14	51	12	45	40	27	28	28	40	20	38	19
South Eaton.	33	27	34	19	23	9	22	9	28	8	49	16	48	30	27	28	28	46	23	30	23
State College.	38	20	36	15	40	20	22	10	40	8	47	22	40	31	27	28	28	34	23	21	24
Swatmore.	38	34	35	30	26	13	25	15	33	13	43	15	46	24	22	28	28	31	23	29	28
Towanda.	36	30	31	23	21	13	30	12	32	10	43	15	46	24	22	28	28	31	23	29	28
Uniontown.	33	30	32	24	30	13	32	13	38	17	47	22	53	34	40	29	42	42	38	35	30
West Chester.	31	27	38	26	35	13	32	13	43	19	47	22	53	34	40	29	42	42	38	35	30
Wilton.	30	32	40	25	34	13	35	15	43	19	47	22	53	34	40	29	42	42	38	35	30
Willow-Hart.	40	32	45	25	32	17	35	15	43	19	47	22	53	34	40	29	42	42	38	35	30
Williamport.	42	35	30	24	32	17	35	15	43	19	47	22	53	34	40	29	42	42	38	35	30
York.	46	37	38	30	39	21	38	20	42	19	52	24	54	33	39	38	44	38	28	38	30

## Maximum and Minimum Temperatures for Pennsylvania, March, 1896.—Continued.

Stations.	11.		12.		13.		14.		15.		16.		17.		18.		19.		20.	
	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.
Allentown.	38	29	32	16	30	11	31	16	35	19	30	25	38	31	42	21	50	33	49	25
Annapolis.	31	20	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Bloomington.	30	21	32	12	32	2	28	9	35	24	38	28	39	31	47	11	56	37	57	26
Carlisle.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Cassidy.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Center Hall.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Charlestown.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Chartersburg.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Copiersburg.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Derry.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Easton.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Emporium.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Erie.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Gottysburg.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Greenville.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Hamburg.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Hamilton.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Harrisburg.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Hollidaysburg.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Honesdale.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Huntington.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Kennett Square.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Lancaster.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Le Roy.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Le Roy.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Lewistown.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Lock Haven.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Lynchburg.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Mauch Chunk.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Philadelphia Co.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Philadelphia do.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Pittsburgh.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Pottstown.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Quakertown.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Saegertown.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26
Scranton.	31	21	32	12	32	4	29	9	35	24	38	28	39	31	47	11	56	37	57	26

Sellins Grove, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Shingle House, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Shimshert, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
South Eaton, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
State College, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Swarthmore, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Towanda, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Uniontown, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
West Chester, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Westtown, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Wilkes-Barre, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Williamsport, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
York, .....	34	42	26	28	32	31	30	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100



Maximum and Minimum Temperature for Pennsylvania, March, 1896—Continued.

Stations.	21.		22.		23.		24.		25.		26.		27.		28.		29.		30.		31.		Monthly mean.	
	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.	Maximum.	Min. num.
Altoona.	46	22	34	41	55	22	35	12	47	19	54	36	55	21	50	25	57	42	64	47	66	38	44.4	25.8
Aqueduct.	41	15	36	28	31	24	36	15	43	17	45	40	36	24	48	19	59	41	67	44	66	36	43.2	24.4
Bloomington.	38	8	32	25	33	20	32	—	37	—	41	25	43	20	52	20	66	37	63	42	53	27	36.2	12.3
Carlisle.	45	15	52	38	59	29	45	6	45	40	51	40	40	22	52	26	66	40	63	42	53	35	42.2	22.5
Cassidonia.	43	11	42	38	52	28	43	4	44	32	49	36	38	16	46	16	54	36	67	42	62	33	37.6	22.4
Center Hall.	38	12	40	14	38	8	30	15	43	2	52	27	28	34	46	20	54	38	66	43	60	38	37.6	17.5
Chambersburg.	42	17	46	30	42	18	33	13	47	12	52	31	39	20	52	21	66	38	68	50	66	37	44.6	24.2
Coopersburg.	46	19	53	31	40	23	46	11	47	13	50	36	40	23	52	21	66	38	68	42	64	39	44.8	21.2
Coatesville.	47	17	53	31	40	23	46	11	47	13	50	36	40	23	52	21	66	38	68	42	64	39	44.8	21.2
Dyersburg.	48	18	54	32	41	24	47	12	48	14	51	37	41	24	52	22	67	42	67	42	64	39	44.8	21.2
Easton.	36	16	43	28	34	15	32	3	45	11	57	34	32	20	44	22	47	35	57	39	61	40	38.0	23.0
Emporium.	42	18	48	34	45	21	45	10	48	15	57	34	32	20	44	22	47	35	57	39	61	40	38.0	23.0
Etter.	45	19	51	37	46	25	51	13	51	17	58	40	39	19	58	23	67	47	53	41	56	39	38.7	20.8
Gettysburg.	40	8	40	28	35	16	38	—	42	10	46	20	32	14	42	16	60	43	60	42	62	32	38.5	18.2
Greensburg.	40	18	52	30	39	25	37	12	46	12	58	38	40	20	51	29	61	38	67	44	65	36	41.7	24.3
Hamilton.	41	9	45	30	39	26	37	12	46	12	58	38	40	20	51	29	61	38	67	44	65	36	41.7	24.3
Harrisburg.	36	17	52	30	39	25	37	12	46	12	58	38	40	20	51	29	61	38	67	44	65	36	41.7	24.3
Hollidaysburg.	35	19	48	30	40	24	34	—	43	—	46	29	34	19	46	12	54	36	60	43	65	30	38.2	17.8
Honesdale.	45	12	49	38	46	20	34	—	43	—	46	29	34	19	46	12	54	36	60	43	65	30	38.2	17.8
Huntington.	42	20	50	37	47	22	39	12	45	12	59	35	38	20	50	26	69	36	64	50	63	31	42.4	21.6
Kennett Square.	42	16	50	37	47	22	39	12	45	12	59	35	38	20	50	26	69	36	64	50	63	31	42.4	21.6
Lebanon.	40	17	51	28	41	24	31	10	41	15	45	25	38	20	50	26	69	36	64	50	63	31	42.4	21.6
Le Roy.	36	6	40	21	21	7	20	0	35	15	45	25	38	20	50	26	69	36	64	50	63	31	42.4	21.6
Lewistown.	41	11	51	32	35	11	34	0	41	18	47	26	38	20	50	26	69	36	64	50	63	31	42.4	21.6
Lock Haven.	43	15	50	30	32	18	37	6	46	13	46	26	38	20	50	26	69	36	64	50	63	31	42.4	21.6
Lycippus.	28	13	47	27	43	18	27	6	46	18	55	46	51	19	49	23	55	40	67	40	68	29	38.7	21.9
Mauch Chunk.	44	22	52	35	36	23	33	15	48	24	53	43	38	24	51	31	61	41	60	43	62	33	38.8	21.8
Philadelphia (a).	45	22	52	35	36	23	33	15	48	24	53	43	38	24	51	31	61	41	60	43	62	33	38.8	21.8
Philadelphia (b).	45	18	49	26	28	19	34	12	57	26	53	38	37	21	60	28	68	42	66	44	64	41	44.7	23.0
Pittsburgh.	42	20	54	34	32	24	36	12	46	18	62	36	38	22	53	24	62	42	66	44	64	41	44.7	23.0
Pottstown.	40	17	52	29	30	24	32	9	41	21	50	31	35	15	49	20	54	36	64	40	62	38	41.2	21.7
Quakertown.	40	10	41	25	30	13	35	1	40	21	50	31	35	15	49	20	54	36	64	40	62	38	41.2	21.7
Saegertown.	39	12	43	31	39	15	30	2	42	10	55	40	49	17	49	22	54	36	65	39	61	33	39.4	19.4
Scranton.	39	12	43	31	39	15	30	2	42	10	55	40	49	17	49	22	54	36	65	39	61	33	39.4	19.4

Selins Grove, .....	42	9	53	23	37	14	33	—	2	43	10	51	29	51	19	56	19	53	35	68	37	55	30	42.2	19.0
Shingle House, .....	43	5	44	5	25	8	37	—	6	47	17	41	24	44	8	50	12	60	38	60	20	52	54	38.6	12.5
Smethport, .....	41	3	41	33	26	11	36	—	6	52	18	47	24	33	14	49	13	62	38	62	38	61	24	26.7	15.3
Somershet, .....	32	10	42	28	43	16	50	—	2	54	16	44	20	38	16	56	15	65	40	66	44	60	32	42.8	18.7
South Eaton, .....	38	10	40	25	28	16	29	—	6	39	11	52	27	30	18	47	19	57	35	64	40	61	30	38.2	19.0
State College, .....	49	14	47	28	30	15	36	3	40	19	45	25	25	33	17	45	19	50	38	61	44	60	34	37.2	20.1
Swarthmore, .....	41	10	45	33	23	13	26	3	41	14	48	33	28	28	13	45	19	54	37	63	38	60	28	35.5	17.9
Towanda, .....	43	17	43	34	27	20	32	6	54	23	54	28	28	37	24	58	30	68	49	67	50	64	40	40.5	24.6
Uniontown, .....	43	19	52	32	41	21	28	12	43	15	60	37	40	37	22	49	22	62	38	64	49	63	43	42.8	26.3
West Chester, .....	42	22	52	34	41	23	27	13	43	11	62	38	38	39	23	48	24	64	38	64	48	61	43	42.4	26.3
Westtown, .....	41	16	49	31	41	18	31	8	44	19	59	37	43	43	20	51	20	57	38	67	41	66	32	41.3	22.1
Wilkes-Barre, .....	40	16	46	32	26	18	31	7	40	19	47	33	36	36	20	46	20	52	38	64	40	62	33	38.7	21.8
Williamsport, .....	43	16	53	33	45	25	33	3	43	15	63	34	34	38	23	54	22	59	31	68	43	62	41	43.7	23.2
York, .....	43	16	53	33	45	25	33	3	43	15	63	34	34	38	23	54	22	59	31	68	43	62	41	43.7	23.2







Glarville,	2.30	.07		.25		.21		.71		5.00
Grampan,	1.20			.15		.11				4.02
Hamlet,	.87	†		.30		.15		.54		3.85
Holladayburg,	1.04			.23		.17		.78	†	4.94
Huntington,	.90	1.70		.58		.40		.40	.22	3.20
Lancaster,				.52		.12		.80		4.95
Lebanon,	1.44			.02		.12		.80		5.29
Le Roy,	1.60	.10		†		.12		.23		4.53
Lewistown,	1.82			.14		.11		.48		3.74
Lock Haven,	1.82			.20		.44		.47		5.48
Scranton,	1.80			.10		.24		.54		4.78
Selling Grove,	1.41	.05		.10		.18		.23		4.04
South Eaton,	.95	†		.19		.23		.53		4.45
State College,	1.40	.02		.08		.07		.33		2.82
Towanda,	1.60			.05		.15		.17	.01	3.88
Towanda,				.05		.15		.06		3.00
Wellsville,	.35	.04		.30		.22		.53		6.31
Wilkes-Barre,	1.71			.17		.22		.33		4.17
Williamsport,	1.66			.02		.13		.68	.06	4.20
York,	.99			.35		.02				
Ohio Basin.										
Beaver Dam,	1.08	.10		.01		.10		.32		3.32
Brookville,	.45	.11		.03				.17	.33	2.47
Cassandria,	.15	†		.11		.40		.22	.28	5.24
Cumference,	.25			.01	†	.20		.22	.12	4.21
Davis Island Dam,				.03		.05		.60	.25	4.21
De Bois,	1.02	.09						.44	.30	3.99
Elwood Junction,	.63			.14				.50	.06	3.87
Freeport,	1.30	.14				.10		.22	.18	3.04
Greensboro,	1.01	.10		.04		.10		.35	.13	4.20
Greenville,	.75	.05		.04		.20		.25	.17	4.10
Lytleport,	.89	.04		.05		.23		.24	.09	4.17
Johnstown,	.36	†		.02		.24	†	.26	.11	3.80
Lock No. 4,	.17	.09		.06		.20		.35	.06	4.03
Oil City,	.60	.32		†		.01		.38	.05	3.18
Parkers Landing,	.95	.19		.04		.09		.33	.08	3.46
Pittsburgh,	†	.14	.06	.04	.19		.34	.27	.29	4.13
Ridgeway,	.75	.20		.06		.10	.34	.40	.01	3.21
Saegerstown,	.75	.45						.34		3.42
Shingle House,	1.30			.50		.36		.24		2.70
Smethport,	.28	.35				.30		.33		4.23
Somerset,	.08					.18				4.72
Uniontown,	.11	.11		.30		.26		.21	.14	4.61
Warren,	.51			.01	†	.10		.02		3.96
West Newton,	.21	†	.50	.05		.31		.50	.08	4.53
Potomac Basin.										
Chambersburg,	1.30					.24		.14		4.58
Lake Basin.										
Erie,	.72	.08			†	†		.10	†	3.41

† Trace, when precipitation is less than 0.01 inch.

\* Precipitation included in that of following day.

## APRIL.

## Climatology of the Month.

The general characteristics of April were its three distinctive periods of decided temperature conditions, which prevailed during the first, middle and latter part of the month. From the 1st to the 12th the continued cold weather almost completely held in check all visible signs of growth in vegetation, and spring seemed to make no advancement. This period of cold was followed by one of ten days of torrid heat. During this period growth was as marvelous as the unprecedented heat. Cereals and grasses sprang up as if by magic, trees burst into leaf and blossom, and the face of nature was rapidly changed from its dress of winter to its garb of spring. This rapid growth was somewhat checked by the cool weather which followed and prevailed from the 22d to the end of the month. The season, which was backward at the beginning of April, was fully up to the average at its close. Numerous frosts were reported on the 23d, but they were not damaging.

## Atmospheric Pressure.

The mean pressure for the month, 30.13 inches, is about 0.09 inch above the normal. At the United States Weather Bureau stations the highest observed was 30.62 inches, at Erie on the 8th, and the lowest, 29.71 inches, at Philadelphia on the 21st.

## Temperature.

The average temperature for April, 53 degrees, is 4.6 degrees above the average.

The highest recorded temperatures occurred on the 18th, and were as follows: Carlisle, 97 degrees; Coatesville, Lebanon, Aqueduct, and Honesdale, 95 degrees.

The lowest temperatures were on the 4th and 5th, and were as follows: Saegerstown, 4 degrees; Blooming Grove, 7 degrees; Shingle House and Smethport, 12 degrees; Le Roy and Centre Hall, 13 degrees.

The means of the daily maximum and minimum temperatures, 64.1 degrees and 41.9 degrees respectively, give a monthly mean of 53 degrees, which is 3.8 degrees above the corresponding month of 1895.

The average daily range was 22.2 degrees.

The highest monthly mean was 57 degrees, at Pittsburg.

The lowest monthly mean was 45 degrees, at Blooming Grove.

The highest temperature recorded during the month was 97 degrees, on the 18th at Carlisle.

The lowest temperature was 4 degrees, on the 5th at Saegerstown.

The greatest local monthly range was 81 degrees, at Saegerstown.

~~The least local monthly range was 61 degrees, at Erie.~~





The greatest local monthly range was 81 degrees, at Saegerstown.

The least local monthly range was 61 degrees, at Erie.

The greatest daily range was 52 degrees, at Honesdale.

#### Precipitation.

The average precipitation for the month, 1.75 inches, is 1.76 inches less than the average.

The largest totals of rainfall and melted snow, in inches, were: Pittsburg, 3.39; Somerset, 3.27; Oil City, 2.96; Saegerstown, 2.95; Cassandria and Confluence, 2.89. The least were: Honesdale, 0.20; Dyberry, 0.67; Wellsboro, 0.91; Towanda, 0.93; Shawmont, 0.96; Scranton and Chambersburg, 0.97.

The heaviest snow fall, in inches, was: Cassandria, 14.0.

#### Wind and Weather.

The prevailing wind was from the west.

Average number of rainy days, 8; clear, 10; partly cloudy, 10; cloudy, 10.

#### Miscellaneous Phenomena.

Thunderstorms.—West Chester, 20th; Lancaster, 20th, 21st; Kennett Square, 19th, 21st; Mauch Chunk, 17th, 20th; Coopersburg, 18th, 21st, 22d; Easton, 17th, 20th, 21st; Lebanon, 20th, 21st; Lewisburg, 17th, 20th; Quakertown, 17th, 20th, 21st; Selins Grove, 20th; Swarthmore, 21st; York, 20th, 21st; Carlisle, 17th, 20th, 21st, 22d; Hamlington, 17th, 21st; Cassandria, 12th, 20th, 21st; Towanda, 17th, 21st; Scranton, 17th, 21st; Uniontown, 9th, 20th, 24th; Coatesville, 17th, 21st; South Bethlehem, 17th, 20th; South Easton, 17th, 21st; Le Roy, 17th; Center Hall, 20th; Saegerstown, 10th, 11th; Wellsboro, 17th, 19th; Shawmont, 21st; White Haven, 17th; Pittsburg, 1st, 11th, 20th, 24th; State College, 20th; Somerset, 11th, 24th, 29th; Lock Haven, 20th; Grampian, 12th, 20th; Philadelphia (Centennial Ave.), 17th, 20th; Williamsport, 20th; Johnstown, 11th, 24th; Hollidaysburg, 12th, 20th, 21st; Emporium, 17th; Blooming Grove, 17th, 21st.

Frost.—Lebanon, Uniontown, Cassandria, Towanda, Williamsport, Coatesville, Selins Grove and Somerset, 23d; Philadelphia (Centennial Ave.), Huntingdon, Quakertown, and York, 9th, 23d; State College and Emporium, 8th, 9th, 23d; South Easton, 1st, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th; Saegerstown, 2d, 3d, 4th, 5th, 6th, 7th, 8th; Wellsboro, 1st, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 23d; Pittsburg, 2d, 5th, 6th, 8th, 23d; Blooming Grove, 23d, 24th, 25th, 27th; Lewisburg, 1st, 9th, 23d; Hollidaysburg, 2d, 3d; Grampian, 22d; Johnstown, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th; Kennett Square, 27th; Mauch Chunk, 5th, 9th; Dyberry, 1st, 23d, 24th; Easton, 9th; Scranton, 1st, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 21st, 23d.

*Climatological Data for Pennsylvania, April, 1896.*

Counties.	Stations.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.				Sky.				
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total melted.	Number rainy days.	Number clear days.	Number partly cloudy days.	Prevailing direction of wind.
Adams.	Gettysburg.	842	28	57.0	+6.0	90	18	22	3	33	3.39	+0.56	0.94	0.4	11	9	8	13 W
Allegheny.	Pittsburg.	812	24	54.4	+5.0	94	18	21	3	42	2.63	-1.58	0.60		6	3	19	8 NW
Berks.	Hamburg.	380	15	53.9	+3.0						1.10	-2.18			9			
Berks.	Reading, 2	289	7	52.9	+3.0						1.38	-1.31	0.53	T	9			
Blair.	Altoona.	1,181	8	56.0	+3.9	88	19	21	3	33	1.38	-1.31	0.53	T	10	14	7	9 W
Blair.	Hollidaysburg, b.	1,917	8	55.0	+5.9	91	18	21	8	44	2.67	-1.26	0.50		11	6	13	15 SW
Bradford.	Le Roy.	1,400	7	49.8	+5.4	87	19	13	4	38	1.41	-2.59	0.30	3.7	6	11	6	13 W
Bradford.	Towanda.	754	7	51.0	+5.4	87	18	19	4	41	0.93	-1.98	0.28	1.0	6	11	6	13 W
Bucks.	Forks of Neshaminy, 1	304	7	56.1	+5.2	92	17	22	9	46	1.61	-1.73	0.16	T	9	4	15	11 NW
Bucks.	Quakertown.	536	21	52.2	+4.1	85	17	20	3	31	2.59	-1.61	14.0		13	9	11	10 NW
Cambria.	Casandria.	2,100	8	54.6	+4.6	91	18	21	3	46	2.57	-1.49	0.50	1.0	7	10	9	11 S
Cambria.	Johnstown.	1,184	8	51.3	+2.6	89	17	21	3	43	1.83	-1.38	0.56	T	7	12	9	9 W
Cameron.	Emporium.	1,060	6	52.9	+5.5	92	18	23	3	47	1.32	-1.90	0.56	1.0	8	17	7	6 W
Carbon.	East Mauch Chunk.	1,191	8	52.0	+4.4	90	17	21	3	34	1.41	-1.61	0.0		9	6	10	14 W
Center.	State College.	1,191	8	53.4	+4.4	90	18	13	4	38	1.41	-2.83	0.45	T	4	18	3	9 NW
Center.	Center Hall, a.	465	40	54.2	+4.0	92	18	20	4	38	1.49	-2.83	0.45		7	17	7	6 NW
Chester.	West Chester.	380	8	53.9	+4.5	96	18	22	9	41	1.38	-2.40	0.45		7	17	7	6 NW
Chester.	Coatesville.	275	6	53.6	+4.5	92	18	22	9	41	1.38	-2.40	0.45		7	17	7	6 NW
Chester.	Kennett Square.	350	6	53.6	+5.8	93	18	27	4	39	2.03	-1.69	0.68	0.2	11	12	12	6 SW
Chester.	Westtown.	350	6	53.6	+5.8	93	18	27	4	39	2.03	-1.69	0.68	0.2	11	12	12	6 SW
Chester.	Grampian.	1,450	21	52.6	+6.8	86	18	18	5	34	2.40	-0.93	0.48	2.0	10	1	18	11 W
Chester.	Lock Haven.	1,560	8	55.6	+6.5	94	18	21	3	51	1.21	-1.95	0.42		7	11	10	9 W
Chester.	Seegerstown.	1,200	4	50.6	+5.0	85	18	4	6	43	2.96	+0.45	0.78	2.3	12	3	10	17 S
Chester.	Crawford.	1,200	4	50.6	+5.0	85	18	4	6	43	2.96	+0.45	0.78	2.3	12	3	10	17 S
Cumberland.	Carlisle.	480	8	51.6	+4.8	97	18	25	3	39	2.83	-0.84	0.50		10	9	13	8 S
Cumberland.	Dauphin.	381	7	54.5	+3.0	92	18	24	3	36	1.10	-1.44	0.29		9	18	8	12 E
Delaware.	Harrisburg.	190	7	55.7	+5.2	92	18	25	8	28	1.93	-0.89	1.00		5	5	18	7 S
Delaware.	Swarthmore.	1,220	7	50.7	+7.0	80	18	18	3	40	1.46	-1.00	0.29	1.0	13	5	14	11 W
Delaware.	Edinboro, * 1	1,400	22	51.0	+4.7	81	18	20	3	40	1.46	-1.00	0.29	2.5	10	15	11	4 S
Erie.	Erie.	681	8	55.9	+4.7	89	18	23	3	33	2.62	-1.00	0.35		13	5	14	11 W
Erie.	Erie.	681	8	55.9	+4.7	89	18	23	3	33	2.62	-1.00	0.35		13	5	14	11 W
Fayette.	Uniontown.	681	8	55.9	+4.7	89	18	23	3	33	2.62	-1.00	0.35		13	5	14	11 W

Franklin.	1,000	4	53.6	-1.4	93	18	23	8	43	0.97	-1.77	0.27	2	9	1	17	W		
Huntingdon.	650	8	54.2	+5.4	93	18	20	8	46	2.02	-1.21	0.35	11	1	13	16	W		
Lackawanna.	741	8	51.8	-3.2	91	18	19	4	43	0.97	0.25	0.35	7	12	7	11	W		
Lancaster.	413	8	53.1	+3.2	92	18	24	3	41	1.24	-2.44	0.37	8	11	16	3	W		
Lebanon.	520	8	53.7	+4.5	95	18	24	3	39	1.25	-2.45	0.46	9	13	8	9	W		
Lehigh.	520	6	53.8	+4.4	91	17	23	4	38	1.37	-1.97	0.40	9	16	9	5	NW		
Coopersburg.	1,250	5	51.8	-5.1	90	18	20	4	38	1.00	0.34	3.0	2	22	6	6	NW		
White Haven, * 1	575	6	54.6	+5.1	94	18	21	4	39	1.06	-1.78	0.30	7	4	10	6	W		
Luzerne.	530	5	52.6	-4.9	90	18	23	3	33	1.03	0.46	T	6	16	10	4	W		
Lycoming.	1,000	4	48.8	+4.9	87	17	12	5	44	1.88	-1.88	0.80	6	8	8	14	W		
McKean.	1,000	5	48.8	+4.1	87	17	12	5	44	1.88	-1.88	0.80	6	8	8	14	W		
Greenville.	1,000	5	48.8	+4.1	87	17	12	5	44	1.88	-1.88	0.80	6	8	8	14	W		
Pottstown.	160	18	18.2	+4.1	94	18	27	4	40	1.83	-1.81	0.72	7	21	1	8	W		
Montgomery.	339	19	18.2	+4.8	91	18	28	4	39	1.23	-2.07	0.46	11	13	6	6	W		
Northampton.	325	12	53.8	-3.7	89	18	23	4	41	1.85	-2.17	0.33	0	2	13	11	NW		
Easton.	387	7	55.8	+4.6	95	18	28	3	42	1.19	-1.82	0.31	9	9	11	7	NW		
Aqueduct.	117	25	55.2	+3.4	93	18	28	4	72	1.21	-2.71	0.2	10	9	14	7	SW		
Philadelphia.	120	5	55.8	+3.4	93	18	28	4	46	0.90	-2.82	0.36	5	2	1	12	SW		
1529 Centennial Avenue.	1,475	8	45.0	-0.9	87	18	7	4	46	0.90	-2.82	0.36	5	2	1	12	SW		
Blooming Grove.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Pike.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Potter.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Shilling House.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Sellinggrove.	455	7	53.0	+3.8	91	17	23	4	44	1.16	-2.07	0.53	1.0	0	2	8	SW		
Snyder.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Somerset.	2,250	8	51.4	+5.7	87	18	15	8	45	3.27	-0.96	0.65	4.1	9	11	10	9	SW	
Tioga.	1,327	8	46.2	+8.4	85	18	14	5	...	...	...	...	...	...	...	...	...		
Union.	1,327	6	53.4	+4.3	92	18	23	4	46	1.11	-2.33	0.47	T	5	7	11	8	W	
Lewisburg.	450	6	53.4	+4.3	92	18	23	4	46	1.11	-2.33	0.47	T	5	7	11	8	W	
Dyberry.	1,100	20	47.8	+4.3	88	18	16	4	47	0.67	-2.35	0.24	2.5	6	14	6	10	NW	
Wayne.	1,000	11	52.0	+7.7	95	18	16	5	52	0.20	-2.76	0.16	T	2	19	5	6	NW	
Wenatchee.	1,000	7	50.4	+5.9	86	18	16	4	39	1.18	-2.80	0.23	3.2	13	10	8	12	W	
Honesdale.	1,600	3	55.6	+4.9	88	19	21	3	36	2.33	-2.44	0.86	...	...	...	...	...		
Hamilton.	1,000	3	55.6	+4.9	88	19	21	3	36	2.33	-2.44	0.86	...	...	...	...	...		
Wayne.	1,420	6	50.6	+4.3	91	19	20	4	38	1.13	-1.49	0.74	2	0	7	13	7	10	SW
Lycippus.	1,690	6	50.6	+4.3	91	19	20	4	38	1.13	-1.49	0.74	2	0	7	13	7	10	SW
South Eaton.	385	8	51.8	+4.4	91	18	26	8	42	1.43	-1.46	0.60	T	8	15	10	5	W	
York.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		

\* Extremes of temperature from observed readings of dry thermometers.

1 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. + 4.

A Roman letter following the name of a station indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

A Roman letter following the name of a station or placed against the data in the body of the form, indicates the number of days missing from the record; for instance, "n" denotes 14 days missing.

Maximum and Minimum Temperatures for Pennsylvania, April, 1896.

Stations	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Allentown.	63	44	54	38	49	21	36	25	43	21	54	38	56	31	43	29	53	29	55	28
Aqueduct.	49	43	54	28	37	28	40	30	51	31	59	39	45	32	49	29	56	28	43	36
Bloomington.	46	32	42	22	34	9	19	7	41	15	46	17	41	16	42	20	46	10	42	22
Carlsburg.	47	41	50	32	37	20	42	16	62	38	60	35	42	29	52	26	52	24	42	31
Chambersburg.	51	46	52	36	37	20	28	22	45	24	48	32	39	25	44	20	48	36	46	35
Center Hall.	49	42	43	25	30	19	32	13	48	24	54	31	38	26	43	24	52	16	41	35
Chambersburg.	49	42	48	33	35	24	39	28	53	24	56	30	41	27	51	23	53	23	45	32
Coopersburg.	48	41	53	34	38	27	42	27	53	29	56	29	41	30	51	29	55	22	40	31
Coopersburg.	49	40	49	35	34	24	43	23	52	24	54	33	36	31	54	31	54	28	44	31
Dyersburg.	42	26	43	33	29	17	34	16	42	24	43	22	34	22	45	25	42	30	43	32
Easton.	52	35	47	30	42	24	41	21	47	30	48	30	46	31	46	31	61	26	49	33
Emporium.	48	32	46	25	32	21	33	21	48	22	52	32	38	28	47	23	51	28	48	31
Erle.	61	34	40	23	30	20	33	23	43	24	38	30	33	26	40	24	54	25	45	35
Gettysburg.	50	42	38	22	26	20	28	23	46	18	44	30	32	27	46	23	50	23	42	34
Greenville.	48	43	50	38	36	23	43	25	52	29	52	41	40	30	51	33	54	24	42	34
Hamburg.	44	32	39	29	27	16	36	16	45	21	50	28	33	22	44	26	51	24	40	31
Harrisburg.	46	42	46	31	33	21	37	23	50	30	56	38	40	31	51	32	50	35	42	35
Hollidaysburg.	48	42	44	34	38	20	44	18	50	13	48	28	36	28	52	24	53	21	52	33
Honesdale.	49	40	46	31	35	25	36	25	52	21	58	30	42	24	54	30	54	30	58	32
Huntingdon.	49	45	55	31	31	21	32	22	44	21	53	31	40	25	53	20	56	24	50	36
Johnstown.	49	40	49	38	36	27	42	27	52	27	51	31	43	29	51	29	54	24	42	31
Kennett Square.	52	41	50	30	35	24	40	25	43	29	48	37	51	31	53	28	51	34	45	32
Lancaster.	47	42	49	33	35	24	41	25	52	28	54	31	42	28	53	29	53	28	46	35
Lebanon.	47	31	43	23	24	16	40	13	40	20	47	25	32	20	39	25	49	23	43	31
Le Roy.	47	34	49	29	37	24	41	23	54	26	53	33	42	19	52	30	58	26	43	31
Lewisburg.	60	35	51	33	34	21	40	24	56	24	60	33	41	28	53	35	57	24	54	36
Lock Haven.	64	47	61	32	39	21	38	22	53	23	54	34	39	26	51	33	58	34	42	36
Lycippus.	48	32	48	35	34	22	43	22	53	23	54	27	41	32	49	31	52	24	44	34
Mauch Chunk.	51	41	50	34	37	28	43	28	50	31	47	37	41	32	49	31	51	32	41	34
Philadelphia (a).	54	46	50	40	45	29	46	26	52	30	48	38	36	29	43	26	47	31	46	38
Philadelphia (b).	66	46	46	28	31	22	38	26	54	28	49	36	36	29	43	26	47	31	46	38
Pittsburg.	50	44	50	34	36	24	44	27	53	30	54	34	47	33	50	32	56	34	46	38
Pottsville.	48	34	50	36	36	24	42	27	51	22	52	32	27	41	49	30	50	34	44	33
Quakertown.	65	36	57	23	31	15	31	19	46	4	48	26	34	23	46	10	50	22	43	33
Sugarstown.	65	36	57	23	31	15	31	19	46	4	48	26	34	23	46	10	50	22	43	33

Scranton, .....	52	31	45	36	38	20	38	19	46	27	25	46	30	53	33	47	32
Shiningame, .....	55	35	46	31	35	23	34	27	56	37	37	50	35	38	35	47	35
Shanley House, .....	53	38	48	32	34	14	24	12	34	36	40	50	16	43	36	46	36
Shanley House, .....	44	26	25	21	26	16	29	17	45	49	53	58	25	42	50	41	31
Somersport, .....	54	43	42	15	23	26	20	20	25	52	59	65	11	52	41	41	31
Somersport, .....	47	29	41	23	33	31	37	20	35	51	52	57	23	42	34	46	32
South Eaton, .....	50	38	41	24	32	31	30	22	34	51	51	54	24	53	37	45	33
State College, .....	47	50	31	36	29	43	31	49	44	34	33	46	28	53	36	43	36
Swarthmore, .....	47	30	44	37	30	23	25	19	44	34	36	46	28	51	33	43	33
Towanda, .....	67	40	40	30	33	33	33	23	58	31	50	53	23	43	37	43	37
Uniontown, .....	49	45	46	36	36	26	41	30	50	36	43	50	48	30	52	41	33
West Chester, .....																	
Westtown, .....																	
Wilkesbarre, .....	58	33	49	36	39	33	42	21	51	36	53	28	40	31	57	45	32
Williamsport, .....	40	36	44	33	30	23	37	34	48	31	53	29	47	33	49	37	43
York, .....	53	44	47	36	36	37	41	26	53	27	54	32	42	37	51	36	35







*Maximum and Minimum Temperatures for Pennsylvania, April, 1896.—Continued.*

Stations.	21.		22.		23.		24.		25.		26.		27.		28.		29.		30.		31.		Monthly mean.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	83	63	75	43	63	40	69	47	55	49	68	51	71	54	64	54	70	53	73	54	.....	.....	66.7	44.2
Aqueduct.	81	56	63	41	76	34	57	50	68	48	68	53	69	51	64	52	64	55	71	57	.....	.....	67.1	44.6
Blooming Grove.	72	38	57	34	62	24	60	20	68	21	67	45	64	46	64	28	74	52	66	36	.....	.....	60.6	29.4
Carlisle.	65	48	79	41	71	37	61	47	63	46	70	48	58	43	68	33	75	50	70	53	.....	.....	66.3	43.3
Cassandria.	68	63	48	40	64	33	52	52	62	50	72	54	63	43	62	53	73	56	66	49	.....	.....	60.1	46.3
Center Hall.	73	64	66	49	70	51	65	45	67	49	70	46	63	41	66	48	77	51	68	53	.....	.....	68.2	43.7
Chambersburg.	79	59	72	45	68	34	60	49	61	45	66	41	65	39	61	49	72	51	69	45	.....	.....	68.2	42.1
Coatesville.	79	59	64	53	69	40	55	46	58	47	64	45	64	41	60	46	72	51	70	43	.....	.....	63.7	42.4
Coopersburg.	76	59	67	48	69	39	60	46	61	41	73	34	69	45	64	41	74	51	70	46	.....	.....	63.7	42.9
Dyberry.	76	58	61	50	61	38	60	46	58	48	66	41	65	40	67	48	74	50	71	50	.....	.....	64.2	42.9
Easton.	72	55	60	40	70	30	57	46	58	43	71	41	66	40	67	48	74	50	71	50	.....	.....	63.2	42.9
Emporium.	64	47	48	29	54	19	37	46	53	44	63	46	72	49	70	51	59	41	73	45	.....	.....	59.5	41.6
Erle.	70	56	60	36	68	45	63	54	62	46	72	50	68	50	72	52	78	54	73	60	.....	.....	63.3	43.8
Gettysburg.	70	56	60	36	68	45	63	54	62	46	72	50	68	50	72	52	78	54	73	60	.....	.....	63.3	43.8
Grampian.	78	57	63	50	73	40	53	49	60	44	70	45	65	45	55	46	78	59	61	49	.....	.....	64.9	43.9
Greenville.	78	57	63	50	73	40	53	49	60	44	70	45	65	45	55	46	78	59	61	49	.....	.....	64.9	43.9
Hamburg.	77	57	62	47	68	35	60	39	55	39	71	43	63	45	54	42	72	51	67	43	.....	.....	60.5	40.1
Hamilton.	77	60	64	48	68	45	63	47	61	46	68	47	63	45	61	42	72	51	67	43	.....	.....	63.0	46.0
Harrisburg.	77	59	64	40	73	30	59	47	57	47	74	50	61	51	73	49	75	52	67	56	.....	.....	68.2	41.7
Hollidaysburg.	79	41	78	40	80	30	77	28	65	33	72	40	70	44	74	46	78	42	80	46	.....	.....	68.4	35.7
Honesdale.	78	58	78	.....	72	57	68	58	58	46	73	50	63	52	63	50	74	40	81	67	.....	.....	68.1	43.4
Huntingdon.	75	65	82	53	76	50	84	53	62	51	68	52	68	51	70	54	74	40	81	67	.....	.....	65.8	43.5
Johnstown.	80	58	64	49	63	35	57	46	61	46	63	41	65	39	62	45	71	53	69	46	.....	.....	65.8	43.5
Kennett Square.	81	40	61	47	68	39	59	49	60	41	63	41	66	40	68	45	73	46	67	47	.....	.....	64.2	42.4
Lancaster.	78	58	67	48	68	35	59	46	60	45	66	43	63	43	60	46	75	50	65	50	.....	.....	60.2	30.3
Lebanon.	75	55	64	46	72	32	55	47	62	47	71	43	66	49	61	45	68	46	68	54	.....	.....	60.2	30.3
Le Roy.	77	55	64	46	72	32	55	47	62	47	71	43	66	49	61	45	68	46	68	54	.....	.....	60.2	30.3
Lock Haven.	80	58	74	44	72	36	70	47	61	47	76	49	74	48	67	53	74	46	74	56	.....	.....	69.4	41.4
Lyons.	79	55	61	49	73	34	58	40	61	46	70	44	75	54	64	54	75	57	81	59	.....	.....	64.5	46.7
Lyonsburg.	79	55	61	49	73	34	58	40	61	46	70	44	75	54	64	54	75	57	81	59	.....	.....	64.5	46.7
Marion.	79	61	63	53	68	45	59	47	59	45	63	41	65	43	63	46	73	53	66	46	.....	.....	65.1	46.1
Philadelphia (a).	79	61	71	54	70	43	60	47	59	46	63	41	64	43	66	46	74	63	66	46	.....	.....	66.7	47.6
Philadelphia (b).	76	52	55	42	70	34	75	54	73	50	75	43	68	53	79	57	80	61	70	59	.....	.....	65.7	47.6
Pittsburg.	79	60	63	53	70	44	58	48	59	47	68	46	68	48	60	44	75	63	70	50	.....	.....	66.7	47.6
Port Deposit.	77	55	56	49	60	34	56	39	60	43	65	46	66	38	63	44	75	48	68	43	.....	.....	64.3	40.1
Quakertown.	77	55	56	49	60	34	56	39	60	43	65	46	66	38	63	44	75	48	68	43	.....	.....	64.3	40.1
Sagehen.	63	53	62	34	67	25	70	46	66	46	74	32	74	46	79	49	81	46	76	56	.....	.....	65.2	38.0

Seranton, .....	72	50	67	43	66	32	62	37	60	44	79	41	63	44	63	41	77	45	71	46	.....	64.3	23.4
Sellingrove, .....	80	56	64	45	69	33	51	39	63	45	70	46	66	50	62	47	75	50	69	55	.....	65.0	40.9
Shingle House, .....	76	58	70	53	74	54	73	64	76	64	73	62	70	56	78	60	75	42	78	44	.....	59.9	26.7
Smethport, .....	72	52	64	38	69	25	51	41	59	46	75	33	65	46	70	48	72	46	71	46	.....	61.9	35.7
Somerset, .....	75	45	60	35	75	30	64	28	70	46	75	42	60	47	75	45	80	46	60	48	.....	64.9	27.8
South Eaton, .....	73	56	62	44	65	32	61	38	60	38	70	43	65	50	60	45	75	50	68	43	.....	61.7	21.6
State College, .....	73	57	64	39	63	35	66	45	54	44	69	48	61	51	63	49	71	48	67	48	.....	61.7	42.3
Swarthmore, .....	79	54	62	42	67	52	58	40	60	48	65	42	66	48	67	50	73	49	67	48	.....	64.1	47.3
Towanda, .....	75	57	64	42	63	33	58	36	60	44	72	41	68	52	60	49	73	49	71	47	.....	63.2	29.7
Uniontown, .....	78	57	59	40	68	28	72	53	73	53	72	41	67	54	72	51	81	54	70	51	.....	68.1	48.7
West Chester, .....	77	60	69	51	66	39	56	47	59	41	62	43	64	43	61	46	73	53	67	47	.....	63.6	41.9
Westtown, .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wilkesbarre, .....	79	57	75	45	69	32	65	41	64	45	75	41	69	49	61	45	79	52	72	47	.....	67.1	42.0
Williamsport, .....	76	56	60	43	67	27	55	43	60	46	68	47	63	52	60	48	72	47	65	57	.....	62.0	41.3
York, .....	75	59	64	43	60	36	57	47	63	46	67	43	64	44	66	48	74	51	79	51	.....	63.7	43.5



Harrisburg.	.16	.06	†	†	.10	†	†	.17	.10	.03	
Holidaysburg.	.12						.25	.16	.22	.30	
Huntingdon.	.18	.06					.09	.17	.25	.25	
Lebanon.	.11				.14		•				
Le Roy.	†	.18	.05		.10	.01		.04	.01		
Lewistown.	.03							.16	.20		
Lack Haven.	.04	.12						.27			
Scranton.		.10						.21			
Selma Grove.	.18		.10					.11			
South Eaton.	.07	.06	†		.08		.08	.34	.17	.13	.57
State College.	†	.28			.04			.25	†		
Towanda.								.30	.10		
Wellshoro.	.11	.9			.13			.13	.06		.05
Wilkes-Barre.	.18	.02	†		.13	†	.02	.08	.12	†	
York.											
Ohio Basin.											
Beaver Dam.	.20	.01						.18	.28	.39	.01
Brookville.	.06	.20	.35	.15	.15	.10	.15	.38	.27	.26	
Camasville.	.03	.20	.12	.10	.02	.29	†	.38	.05	.47	†
Confluence.		.28	†	†	†			.27	.12	.47	†
Davis Island Dam.		.22	.06	.05	.03		.65	.26	.07	.42	
Du Bois.		.13	.06	.16			†	.21	.07	.42	
Elwood Junction.			.10	.16				.20	.05		.01
Freelport.	.03	.40	.05	.02		.12	†	.22	†	.35	
Greensburg.											
Greenville.	.01	.04	.01	.15	.02	.01		.20	.01	.43	
Lynchburg.	†	.24	†	.05		†		.21	.03		
Johnstown.		.24	.02	.08		.03		.23	.05	.28	
Lock No. 4.		.10	.08	.12	†			.41	.75	.01	.03
Marble Landing.		.25	.04	.02			†	.21	.04	.33	
Parkersburg.	†	.66	.02					.34	.02	.45	†
Ridgway.		.24	.01	.05	.01		†	.24	.05	.29	
Shagers Run.		.40	.15	.13		.10		.30	.35	.07	.10
Shagers House.			.20								
Shagers.	.21							.15	.06		
Somers.		.31						.65	.60		
Uniontown.	.33	.09			.28	.08		.24	.55		
Warren.	.18	.30	.21	.01	.08	.03	.01	.65	.04	.02	.01
West Newton.	†	.53	†	.09		.01	†	.21	.02	.32	†
Potomac Basin.											
Chambersburg.	.20					.01		.07	.17	.06	
Lake Basin.											
Erle.	.02	.15	.02	†		†	.03	.10	.19	.16	.13

† Trace, when precipitation is less than 0.01 inch.

\* Precipitation included in that of following day.

## Daily Precipitation for Pennsylvania, April, 1896—Continued.

Stations.	Day of Month.														Total.	
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.		31.
Delaware Basin.																
Bethlehem, .....	.41				.35			.24								1.27
Blooming Grove, .....	†					.16		.06				†				0.90
Browns Lock, .....						.43			.41							1.40
Coatesville, .....			.05		.45			.37								1.38
Coopersburg, .....		.10			.40	.30										1.35
Doylstown, .....		.26			.68	.06		.38								1.65
Dyersburg, .....				†	.17				.02			†				0.67
Eaton, .....			.03	.46		.04			.16							1.23
Forks of Neshaminy, .....	.13	.43			.67	.04		.27	.30							1.81
Frederick, .....	.13				.84				.47							1.88
Hamberg, .....	.58			.60	†			.49								2.35
Hamilton, .....	.09				.02	.22			.17		.01	.01				1.18
Honesdale, .....			.07						†							0.20
Kennett Square, .....					.34			.68	.02							2.05
Landale, .....	.02				.57				.51			†				1.42
Mauch Chunk, .....	.17			.21				.36								1.32
Ottaville, .....		.09			.52	.10		.16								1.41
Philadelphia(a), .....		.01	†		.29		.01	.31								1.19
Philadelphia(b), .....		.01	.01		.23			.32								1.21
Point Pleasant, .....				.31	.23			.25								1.39
Pottstown, .....				.72		.12		.45								1.83
Quakertown, .....		.26			.38	.07			.23			†				1.61
Reading, .....					.58	.04		.35								1.10
Selsholtzville, .....	.45				.52			.43								1.81
Shawmont, .....	.04				.28			.28								0.96
Smiths Corner, .....	.18				.49	.11		.28								1.49
Swarthmore, .....					.37			.28								1.93
West Chester, .....					.37			.45								1.49
Westtown, .....																1.49
White Haven, .....	†			†	†			.34				.05				1.00
Susquehanna Bas'n.																
Altoona, .....					.53	.05		.25				.02				1.38
Aqueduct, .....				.33	.02			.32				.01				1.28
Carlisle, .....				.40		.05			.10	.10		.08				2.36
Center Hall, .....				.60				.43								1.41
Emporium, .....					.41	.05		.45				†	.56			1.88
Gottysburg, .....	†															1.88
Girardville, .....					.58			.54				.06				1.88
Grampian, .....	.41			.48	.06			.44				.18				2.40

[illegible]

precipitation included in that of following day.

Trace, when precipitation is less than 0.01 inch.

## CLIMATOLOGY OF THE MONTH.

## GENERAL CHARACTERISTICS.

May was generally favorable for agricultural work and the growth of crops, and at the end of the month the season was somewhat in advance of the average. Droughty conditions prevailed in many localities until after the middle of the month, which interfered with vigorous growth, and, in some cases, retarded germination. A few frosts occurred, but they were not damaging. Unusually high temperatures prevailed from the 16th to the 19th, and the mean temperature of the month was marked by an excess of nearly 6 degrees above the normal.

## Tornadoes.

Destructive tornadoes prevailed during the afternoon of the 28th in southeastern sections of the State. Considerable damage was done near Hanover, York county, at about 2.30 P. M. From thence to the eastern border county the damage was principally confined to washouts caused by heavy downpours of rain at various points. The path of the storm through Hiram township is marked with unroofed barns, uprooted trees, and demolished fences. In Wrightsville several buildings were damaged and trees blown down. In a funnel-shaped form the storm then passed over the river to Columbia, where it wrecked a planing mill and a portion of the Columbia Rolling Mills, causing the death of one man. From this point to Ambler, Montgomery county, the destruction by wind was comparatively slight, but heavy and excessive rains occurred at Lebanon, Reading, Hamburg, Bethlehem, Easton, etc., which caused damaging washouts and floods in some of these cities and the surrounding country. At about 2.55 P. M. violent and tornadic winds formed in Montgomery county near Ambler, and with destructive force passed through Ambler, Jarrettsville, Horsham, and Hatboro, into Bucks county, through Langhorne, and thence over into New Jersey south of Trenton. The track of the storm through these counties is marked by demolished and damaged buildings, uprooted trees, together with the usual damages and characteristics found in the path of tornadoes. While many people were more or less injured by wreckage, only three in these vicinities are reported as having been killed. In value, the damage to property will amount to hundreds of thousands of dollars.

## Atmospheric Pressure.

The mean pressure for the month, 30.02 inches, is about 0.02 inch above the normal. At the United States Weather Bureau Stations





1000 Dog.

the highest observed was 30.42 inches, at Philadelphia on the 7th, and the lowest, 29.59 inches, at Erie on the 28th.

#### Temperature.

The means of the daily maximum and minimum temperatures, 76.7 degrees and 54.2 degrees respectively, give a monthly mean of 65.4 degrees, which is 5.9 degrees above the normal, and 4.8 degrees above the corresponding month of 1895.

The average daily range was 22.5 degrees.

The highest monthly mean was 70 degrees, at Cannonsburg.

The lowest monthly mean was 59.8 degrees, at Dyberry.

The highest temperature recorded during the month was 98 degrees, on the 7th at Aqueduct.

The lowest temperature was 31 degrees, on the 1st at Blooming Grove.

The greatest local monthly range was 59 degrees, at East Mauch Chunk.

The least local monthly range was 36 degrees, at Erie and Cannonsburg.

The greatest daily range was 49 degrees, at Lebanon.

#### Precipitation.

The average precipitation for the month, 2.85 inches, is 2.48 inches less than the normal.

The largest totals of rainfall, in inches, were: Bethlehem, 6.30; Shingle House, 5.22; Hamburg, 4.96; Seisholtzville, 4.69; Lebanon, 4.54; Freeport, 4.43. The least were: Cannonsburg, 1.19; State College, 1.37; Brookville, 1.51; Westtown, 1.51; West Chester, 1.58; Swarthmore, 1.59.

#### Wind and Weather.

The prevailing wind was from the west.

Average number of rainy days, 10; clear, 10; partly cloudy, 12; cloudy, 9.

#### Miscellaneous Phenomena.

Thunderstorms.—1, 2, 3, 5, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 26, 28, 29, 30, 31.

Hail.—Grampian, 14; Carlisle, 26; Uniontown, 5, 18; Philadelphia (Weather Bureau) 5; Hamlington, Le Roy, and Edinboro, 30; Quakertown, 15.

Frost.—Cassandria, 4, 6, 16; Smethport, 4, 6, 15; Somerset and Uniontown, 4; Dyberry and Blooming Grove, 20.

Aurora.—State College, Saegerstown, Chambersburg, and York, 17; Wellsboro, 22.

Solar Halo.—Le Roy, 22, 23; Philadelphia (Centennial Ave.), 5.

Lunar Halo.—Carlisle, 19.

## Climatological Data for Pennsylvania, May, 1896.

Counties.	Stations.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.				Precipitation, in inches.				Sky.			Prevailing direction of wind.				
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in twenty-four hours.	Total snowfall (unmelted).		Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.
Adams.	Gettysburg.	812	26	69.2	+6.8	90	11	50	4	29	3.91	+0.45	1.01	.....	17	10	12	9	W
Allegheny.	Pittsburg.	380	5	66.7	+6.2	94	9	46	8	43	4.96	-0.47	2.30	.....	7	4	22	6	SE
Berks.	Hanover.	280	7	63.2	+4.4	.....	.....	.....	.....	.....	4.00	-0.90	1.78	.....	12	.....	.....	.....	.....
Berk.	Reading 2.	1,181	8	68.5	+5.8	93	12	50	4	29	2.70	-1.73	0.73	.....	14	.....	.....	.....	.....
Blair.	Altoona.	947	8	66.0	+6.1	94	9	40	4	43	2.64	-3.16	0.43	.....	14	14	7	10	W
Bradford.	Le Roy.	1,400	7	62.9	+6.6	87	11	40	20	30	2.46	-2.84	0.77	.....	11	3	16	12	SW
Bucks.	Towanda.	754	7	63.6	+5.6	90	10	40	20	43	2.38	-1.23	.....	.....	9	13	12	6	W
Bucks.	Forks of Nesquehony, 1 d.	304	7	65.5	+5.6	.....	.....	.....	.....	.....	3.16	-2.77	0.30	.....	12	9	8	10	W
Bucks.	Quakertown.	530	21	64.0	+5.3	92	9	37	8	49	2.91	-2.94	0.78	.....	10	8	17	6	NW
Cambria.	Johnstown.	2,100	.....	67.3	.....	9	11	45	4	31	2.33	.....	0.61	.....	13	8	16	7	NW
Cambria.	Cassandria.	1,184	8	67.8	+8.2	90	9	42	4	44	1.80	-3.02	0.38	.....	16	3	20	8	SW
Cameron.	Emporium.	1,060	8	63.9	+2.8	89	9	39	16	42	3.36	-2.67	1.06	.....	13	10	16	5	W
Carbon.	East Mauch Chunk.	1,550	6	64.6	+6.8	94	9	35	3	48	3.24	-2.06	1.17	.....	9	14	10	12	W
Centre.	State College.	1,191	8	64.6	+6.2	90	9	47	8	39	1.37	-4.11	0.43	.....	11	9	10	12	W
Centre.	Centre Hall.	.....	.....	66.0	.....	93	9	44	8	43	2.00	.....	0.53	.....	7	13	4	14	W
Chester.	West Chester.	435	40	66.4	+6.2	92	11	42	8	34	1.58	-2.57	0.33	.....	12	15	7	9	W
Chester.	Coatesville.	380	8	66.2	+6.2	94	10	46	7	46	2.62	-2.99	0.50	.....	10	15	9	7	W
Chester.	Kennett Square.	275	6	66.2	+6.5	93	11	37	8	44	2.02	-3.48	0.62	.....	10	14	7	10	SW
Chester.	Westtown.	350	6	66.6	+5.7	92	10	38	8	40	1.51	-4.06	0.33	.....	10	15	9	7	SW
Clearfield.	Grampian.	1,460	31	65.1	+8.0	98	9	48	8	36	2.25	-3.64	0.46	.....	12	3	20	8	SW
Clinch.	Lock Haven.	1,560	8	67.6	+7.3	96	9	43	4	46	1.70	-2.60	0.53	.....	7	14	5	12	W
Crawford.	Saegertown.	1,200	4	64.1	+8.2	89	14	35	16	43	1.66	-4.93	0.75	.....	9	9	12	10	NW
Cumberland.	Carlisle.	480	8	66.4	+5.6	96	11	42	8	48	2.92	-1.98	0.60	.....	12	11	7	13	W
Cumberland.	Harrisburg.	361	7	66.0	+4.0	93	9	45	8	48	2.99	-1.78	0.91	.....	12	11	10	10	W
Dauphin.	.....	190	7	67.3	+6.2	93	11	40	7	30	1.59	-3.34	0.42	.....	8	5	16	10	SW
Delaware.	Swarthmore.	1,220	7	62.2	+5.0	82	13	42	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Erie.	Edinboro*1.	.....	22	63.4	+5.0	83	11	47	20	26	2.63	-1.22	0.56	.....	14	8	20	3	W
Erie.	.....	1,100	.....	.....	.....	89	11	42	4	38	3.16	-2.35	0.60	.....	11	16	11	4	SW
Fayette.	Uniontown.	681	8	66.9	+5.4	90	11	40	4	47	3.05	-2.48	1.05	.....	9	8	4	19	W
Franklin.	Chambersburg.	1,000	4	65.4	+4.4	93	11	40	4	47	2.57	-3.68	0.48	.....	12	8	14	9	W
Huntingdon.	Huntingdon a.	650	8	66.2	+6.7	94	0	40	4	46	2.57	-3.68	0.48	.....	12	8	14	9	W

Location	715	618	500	9	37	21	42	252	0.70	11	8	11	12	W
Lackawanna	413	8 67.4	93	11	42	2	32	2.26	-2.41	7	7	22	2	W
Lebanon	428	8 65.0	95	9	42	8	40	4.15	-1.54	14	11	8	12	SW
Lelah	720	6 65.5	90	9	46	1	35	4.75	-2.28	13	14	5	8	SE
Lehigh	1,250	6 65.2	90	10	46	7	35	2.78	0.68	6	4	23	5	S
Luzerne	525	6 66.6	94	9	43	20	44	7.17	-2.97	8	11	10	16	W
Lycoming	530	6 64.4	90	10	45	20	39	1.77	-0.60	9	11	9	16	W
McKean	1,500	4 61.9	87	10	36	4	45	3.34	-3.55	9	12	9	10	W
Merced	1,000	8 67.1	94	10	46	8	40	3.07	-3.29	7	19	2	10	W
Montgomery	1,200	8 67.1	94	10	46	8	40	3.07	-3.29	7	19	2	10	W
Northampton	339	19 71.8	92	10	46	8	40	3.07	-3.29	7	19	2	10	W
Northampton, N.Y.	325	12 66.0	90	10	44	8	36	4.41	-0.41	9	8	11	12	NW
Perry	367	7 68.6	98	17	47	7	42	2.65	-3.65	10	7	10	14	NW
Philadelphia	117	25 67.2	93	11	45	7	39	2.27	-0.85	8	8	9	14	SW
Philadelphia	120	5 67.6	94	11	45	8	36	1.72	-2.20	11	9	10	12	SW
1529 Centennial avenue	120	5 67.6	94	11	45	8	36	1.72	-2.20	11	9	10	12	SW
Pike	8 61.2	2.7	89	17	31	1	38	2.98	-2.40	9	1	15	15	NW
Blooming Grove	8 61.2	2.7	89	17	31	1	38	2.98	-2.40	9	1	15	15	NW
Potter	1,475	61.6	87	9	34	16	47	5.22	2.70	7	10	17	4	NW
Shingle House	455	7 68.0	91	9	43	6	47	2.40	-3.37	7	6	19	12	SW
Snyder	2,250	8 62.3	87	9	35	4	45	3.01	-3.90	11	6	19	6	SW
Somerset	1,257	8 58.1	84	11	36	20	45	1.87	-3.84	9	13	10	8	W
Toga	450	6 65.5	93	9	43	16	45	2.16	-3.09	9	9	5	17	SW
Union	450	6 65.5	93	9	43	16	45	2.16	-3.09	9	9	5	17	SW
Washington	938	23 70.0	88	9	52	1	29	1.19	-2.03	8	9	16	6	SE
Wayne	1,000	20 59.8	90	9	35	20	46	3.58	-1.07	9	10	14	7	W
Wayne	1,000	11	87	9	43	20	33	2.89	-1.61	14	4	10	17	NW
Honesdale	1,600	7 63.2	87	9	43	20	33	2.89	-1.61	14	4	10	17	NW
Hamorton	1,480	3	83	13	49	4	34	2.06	-2.49	13	9	12	10	NW
Lycippus	660	6 62.7	89	10	40	3	34	2.86	-2.11	11	12	12	7	W
South Eaton	365	8 66.0	92	9	41	8	46	2.53	-2.16	11	12	12	7	W
York	365	8 66.0	92	9	41	8	46	2.53	-2.16	11	12	12	7	W

\* Extremes of temperature from observed readings of dry thermometers

1 Mean of 7 A. M. + 2 P. M. + 9 P. M. + 9 P. M. + 4.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

A roman letter following the name of a station, or placed against the data in the body of the form, indicates the number of days missing from the record; for instance "n" denotes 11 days missing.

*Maximum and Minimum Temperatures for Pennsylvania, May, 1896.*

Stations.	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.		11.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona, .....	62	52	56	34	67	54	73	50	79	55	79	50	75	57	69	53	85	57	89	69	89	73
Aqueduct, .....	57	31	58	42	70	51	80	49	87	52	65	50	68	47	69	46	88	53	96	53	96	71
Blooming Grove, .....	79	53	77	60	78	62	78	54	80	60	75	48	68	41	83	46	88	50	88	58	84	60
Cannonsburg, .....	56	49	55	30	61	51	81	47	86	51	61	49	78	47	87	43	88	63	95	65	87	63
Carlisle, .....	66	54	61	54	73	60	75	45	76	58	72	50	68	56	74	50	87	60	97	62	90	70
Cassandria, .....	58	48	56	48	67	56	83	67	82	69	75	60	70	51	66	44	83	50	90	66	89	67
Centre Hall, .....	59	53	59	49	61	56	84	82	84	46	77	45	63	49	68	38	83	44	92	58	93	58
Chambersburg, .....	54	47	54	47	70	51	79	59	84	52	75	52	67	47	69	38	90	47	94	58	93	65
Coatesville, .....	55	45	57	49	65	50	80	58	80	58	72	52	67	47	73	38	90	44	90	58	89	75
Coopersburg, .....	58	38	55	44	64	42	77	40	70	48	69	40	64	42	70	44	89	53	90	65	90	67
Derry, .....	61	47	59	48	67	50	79	53	80	58	77	54	67	47	70	44	89	51	89	50	88	58
Easton, .....	69	54	65	54	75	55	80	40	76	53	74	41	76	43	77	46	86	51	89	50	88	58
Emporium, .....	73	56	80	56	69	54	75	54	65	50	61	48	65	47	77	55	82	64	82	68	83	67
Erie, .....	70	52	64	54	72	54	80	46	78	52	80	50	78	50	80	46	88	60	84	64	86	62
Gettysburg, .....	60	48	54	47	62	49	85	64	82	50	77	52	69	47	73	46	94	52	94	68	94	69
Greenville, .....	65	46	66	45	63	49	84	51	76	56	70	49	67	44	73	46	87	58	86	65	84	67
Hamburg, .....	57	48	54	48	62	49	78	52	80	55	75	53	62	47	65	45	93	50	92	70	91	69
Harrisburg, .....	62	50	59	53	74	54	83	40	83	45	80	42	72	47	71	43	94	53	93	53	94	58
Hollidaysburg, .....	62	52	62	52	72	52	82	40	83	46	77	42	70	50	71	41	94	48	93	54	93	58
Honesdale, .....	74	62	76	60	76	58	84	42	82	53	80	44	76	44	80	46	90	54	88	54	89	57
Huntington, .....	55	45	56	47	70	50	80	47	82	53	74	54	65	45	67	37	92	48	92	62	93	63
Johnstown, .....	56	45	56	42	71	50	71	53	83	51	85	55	71	49	82	53	96	58	91	68	93	73
Kennett Square, .....	57	48	53	47	62	49	80	50	82	50	77	47	64	47	66	46	95	46	95	57	94	60
Lancaster, .....	67	48	62	48	75	50	78	50	72	54	62	48	74	46	74	46	85	55	86	64	87	65
Lebanon, .....	61	51	55	49	69	53	82	49	82	51	76	43	69	51	66	46	93	48	92	57	92	64
Le Roy, .....	70	54	67	54	75	52	89	43	85	53	84	46	77	53	77	45	96	50	91	67	92	60
Lewisburg, .....	68	54	74	56	74	57	74	49	77	56	77	64	73	54	76	52	81	59	87	70	91	61
Lock Haven, .....	60	46	54	47	63	35	84	53	81	47	76	48	70	45	75	46	94	46	93	70	91	61
Lycippus, .....	56	46	59	49	69	50	78	59	80	57	68	48	64	46	65	46	88	51	92	66	94	71
Mauch Chunk, .....	54	46	58	50	69	51	78	59	81	58	68	55	63	46	65	45	88	52	92	66	94	71
Philadelphia (a), .....	74	57	78	53	75	58	79	50	77	58	75	54	75	57	84	65	80	60	82	66	90	67
Philadelphia (b), .....	56	46	58	50	69	51	78	59	81	58	68	55	63	46	65	45	88	52	92	66	94	71
Pittsburg, .....	74	57	78	53	75	58	79	50	77	58	75	54	75	57	84	65	80	60	82	66	90	67
Pottstown, .....	58	46	58	50	70	50	80	58	85	55	77	53	67	49	71	45	92	53	94	63	94	64

Quakertown.	56	39	57	41	68	47	81	54	82	51	74	49	67	43	69	37	01	46	92	61	91	68
Ragers town.	55	51	78	50	71	53	80	37	77	49	71	37	76	38	83	41	88	45	86	48	86	70
Scranton.	67	44	57	42	69	51	81	49	82	50	76	47	70	45	76	44	90	48	90	49	87	63
Shillingrove.	62	50	55	49	72	52	80	48	82	54	77	43	67	50	68	45	94	47	83	60	91	60
Shingle House.	74	55	75	52	74	52	80	38	76	36	71	38	76	36	83	42	87	46	54	44	86	50
Shimshert.	71	52	65	52	74	52	79	36	73	48	75	37	75	39	83	42	86	48	87	48	85	55
Somers.	68	45	70	50	75	52	80	35	70	45	76	40	80	46	82	40	87	52	84	54	81	54
South Eaton.	63	46	56	50	68	40	79	45	75	51	71	47	69	48	70	50	78	48	89	57	87	64
State College.	60	50	53	48	69	51	78	48	77	53	71	48	67	52	68	47	90	51	87	66	87	68
Swarthmore.	57	49	59	51	68	55	78	58	81	57	70	49	65	40	67	51	90	60	92	72	93	64
Tionesta.																						
Towanda.	66	51	60	50	72	53	78	43	75	53	71	43	69	44	72	45	89	46	90	58	87	61
Uniontown.	74	57	74	55	75	55	77	42	79	45	73	45	76	46	79	47	87	52	87	55	89	62
West Chester.	54	46	56	47	68	50	76	58	81	58	71	54	63	46	66	42	90	56	91	66	92	68
Westtown.	54	44	56	49	69	51	77	57	81	57	69	55	62	46	66	38	91	51	92	62	92	66
Wilkes-Barre.	60	50	64	49	71	51	84	49	83	52	79	46	73	48	66	48	94	50	92	58	94	65
Williamsport.	59	51	54	49	67	50	80	48	77	53	71	48	67	51	63	48	89	50	90	50	89	65
York.	57	49	56	49	71	54	78	55	83	50	74	47	63	47	65	44	92	46	92	58	92	62

## Maximum and Minimum Temperatures for Pennsylvania, May, 1898.—Continued

Stations.	12.		13.		14.		15.		16.		17.		18.		19.		20.		21.		22.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	90	65	84	59	79	66	81	66	76	53	87	61	87	66	77	63	77	56	63	52	80	61
Aquebuct.	91	66	84	64	82	65	80	58	85	56	95	68	84	70	80	55	73	51	68	52	89	61
Bloomington.	77	50	78	61	77	58	76	52	79	50	89	63	82	62	75	42	66	40	55	38	78	54
Camonsburg.	81	66	83	66	83	64	76	63	79	58	89	67	80	63	75	66	75	63	78	60	81	68
Carlisle.	90	67	82	63	79	61	84	61	86	49	94	64	81	55	83	59	62	49	59	48	84	59
Cassandria.	83	64	81	64	84	70	72	64	82	51	86	66	77	66	71	64	60	54	71	66	76	65
Centre Hall.	82	62	83	56	81	47	86	45	85	52	87	57	86	66	75	58	75	50	59	47	80	58
Chambersburg.	88	64	82	60	80	60	80	61	82	44	92	62	82	66	82	57	69	60	64	47	83	58
Coatesville.	88	61	82	62	78	57	83	64	84	50	91	58	90	53	85	58	63	51	63	51	80	60
Coopersburg.	78	62	76	59	74	54	81	62	80	51	88	60	85	67	82	61	65	50	59	49	78	57
Dyberry.	76	50	82	45	80	44	78	57	81	42	87	53	83	60	74	48	71	35	60	44	75	52
Easton.	80	59	78	57	77	55	82	62	81	54	90	60	86	63	83	60	71	59	49	49	80	56
Emporium.	79	62	83	55	83	56	75	57	81	39	84	52	81	50	71	54	65	44	66	53	83	58
Erie.	72	56	69	50	78	52	65	53	72	53	75	63	71	66	60	50	66	47	75	54	72	62
Gettysburg.	78	62	82	56	86	62	72	58	82	46	84	62	74	62	68	58	60	52	64	50	73	56
Greensburg.	84	64	81	61	82	57	83	62	86	51	92	61	89	55	82	58	61	48	60	49	82	60
Hamburg.	74	61	79	50	74	52	77	65	79	55	87	60	83	66	78	63	56	43	55	47	76	59
Hamilton.	83	63	79	63	77	60	79	65	82	58	91	54	83	55	78	60	57	52	70	49	84	58
Hillside.	88	62	83	57	86	64	79	56	86	60	91	54	83	55	78	60	57	52	70	49	84	58
Honesdale.	88	62	83	57	86	64	79	56	86	60	91	54	83	55	78	60	57	52	70	49	84	58
Huntington.	88	62	83	57	86	64	79	56	86	60	91	54	83	55	78	60	57	52	70	49	84	58
Johnstown.	84	56	84	58	82	62	76	64	84	53	89	65	84	62	77	66	66	53	65	49	84	59
Kennett.	87	60	83	62	76	57	84	62	82	53	89	63	90	54	89	55	66	50	63	46	80	59
Kennett Square.	80	68	83	67	79	65	80	65	80	53	91	60	87	60	83	62	64	48	63	46	82	61
Lancaster.	88	63	82	60	77	57	82	60	71	48	92	57	80	57	86	60	73	50	60	58	79	58
Le Roy.	70	56	74	50	73	57	74	56	75	50	82	57	80	57	80	50	72	40	67	49	78	56
Lewistown.	73	59	84	56	83	60	83	68	83	43	82	57	86	57	83	56	74	46	61	50	80	52
Lock Haven.	88	62	84	57	86	61	85	62	86	46	80	53	88	58	77	60	57	57	72	48	77	52
Lycippus.	88	62	84	57	86	61	85	62	86	46	80	53	88	58	77	60	57	57	72	48	77	52
Mauch Chunk.	79	55	81	61	77	51	85	59	87	48	93	63	86	50	81	52	68	48	58	47	72	55
Philadelphia (a).	84	70	81	60	77	56	83	64	81	61	89	63	90	63	84	63	50	40	60	53	73	57
Philadelphia (b).	86	68	80	63	76	58	85	64	83	58	90	63	93	65	87	64	66	51	80	51	78	57
Pittsburg.	81	64	81	61	86	63	76	61	82	54	83	66	78	64	75	63	72	58	60	56	80	66
Pottstown.	86	62	80	62	80	53	84	64	84	62	92	63	89	57	85	56	60	56	58	50	80	60

Quakerstown, .....	81	55	79	55	77	50	83	57	81	44	90	55	87	58	86	54	62	46	60	46	82	54
Raegertown, .....	83	59	86	46	89	51	87	57	85	35	87	57	87	60	73	54	74	36	81	43	82	66
Scranton, .....	78	54	81	50	79	51	80	64	83	43	86	56	83	64	77	53	70	41	60	37	89	57
Sellingrove, .....	82	59	84	58	87	59	89	56	84	58	90	54	89	59	85	45	84	47	86	53	88	58
Shingle House, .....	75	54	83	44	84	48	84	54	81	34	84	51	80	62	60	49	68	48	76	50	79	54
Smithport, .....	77	60	82	50	83	48	83	56	81	36	85	49	78	57	66	50	67	42	74	59	81	52
Somerset, .....	85	55	80	54	80	50	75	55	80	48	87	55	82	65	75	50	58	47	72	46	78	58
South Eaton, .....	76	54	78	50	77	53	77	62	80	48	87	55	82	65	75	53	69	42	59	50	80	57
State College, .....	79	63	79	59	78	60	76	65	81	49	86	60	79	63	73	60	61	50	61	48	81	57
Swarthmore, .....	84	65	80	60	78	62	85	58	74	64	90	66	90	65	85	67	57	45	61	56	78	64
Tionesta, .....	78	55	78	56	79	50	79	59	85	45	89	58	85	64	73	51	73	40	62	50	85	56
Towanda, .....	84	62	84	61	87	58	82	58	83	45	83	58	76	57	76	59	74	54	74	53	80	60
Uniontown, .....	85	68	79	63	75	57	81	64	81	56	88	62	88	66	84	62	63	51	61	50	77	60
West Chester, .....	82	62	79	63	76	56	82	63	80	58	84	60	87	61	83	59	63	51	61	51	78	60
Westtown, .....	83	74	85	50	83	55	85	64	86	48	93	57	87	59	80	56	73	43	60	49	77	57
Wilkes-Barre, .....	76	63	80	57	76	60	80	63	83	50	88	59	81	55	74	57	64	45	60	50	79	57
Williamsport, .....	86	66	79	63	78	58	81	62	83	47	92	63	88	56	81	61	66	50	63	49	83	60
York, .....	86	66	79	63	78	58	81	62	83	47	92	63	88	56	81	61	66	50	63	49	83	60



## Maximum and Minimum Temperatures for Pennsylvania, May, 1896.—Continued.

Stations.	23.		24.		25.		26.		27.		28.		29.		30.		31.		Monthly mean.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	81	61	76	56	76	63	77	65	79	61	80	61	79	61	70	53	71	60	77.9	59.1
Aqueduct.	80	62	78	60	64	60	67	61	83	61	80	70	79	61	70	54	76	57	72.3	58.0
Bloomington.	76	57	63	47	66	45	64	54	77	62	63	46	69	48	71	50	67	48	72.4	49.0
Canonsburg.	75	65	69	58	69	56	73	64	78	62	76	63	68	58	74	60	70	69	78.7	61.4
Carlisle.	77	61	77	58	73	66	79	68	79	64	79	65	76	65	80	66	80	66	77.8	54.9
Cassandria.	78	60	77	64	70	63	77	68	79	67	78	67	77	67	80	68	80	69	76.1	59.5
Centre Hall.	77	57	76	53	67	53	69	63	80	57	78	57	77	61	73	53	73	65	77.0	56.1
Chambersburg.	75	61	69	52	68	55	74	69	83	60	82	57	74	56	75	50	78	68	74.6	66.4
Coatesville.	76	62	68	53	64	52	78	66	80	61	83	45	77	69	70	46	69	51	72.6	46.9
Coopersburg.	80	56	68	42	67	47	81	53	82	58	78	43	71	55	73	54	73	66	76.5	56.4
Dyberry.	76	48	75	52	71	52	81	58	80	48	77	54	83	52	67	42	69	50	76.7	51.0
Easton.	75	53	71	51	76	62	80	62	72	59	74	57	64	51	63	52	58	50	71.1	55.6
Emporium.	75	53	71	51	76	62	80	62	72	59	74	57	64	51	63	52	58	50	71.1	55.6
Erie.	75	56	70	54	72	60	78	64	80	64	74	62	68	52	72	64	64	54	75.7	56.0
Gettysburg.	81	62	73	56	63	52	62	62	83	60	73	59	71	57	75	64	77	57	77.9	56.8
Greensburg.	74	56	63	53	62	50	70	57	76	57	67	53	61	56	68	50	66	45	72.7	53.8
Hamburg.	75	66	72	57	65	58	73	62	81	62	78	60	71	56	70	58	74	60	73.0	57.0
Harrisburg.	76	58	77	51	68	60	83	63	82	54	80	56	72	53	70	48	75	56	78.5	53.6
Hollidaysburg.	78	59	76	51	67	55	79	64	83	52	81	63	70	50	73	48	75	56	78.9	52.6
Huntingdon.	79	60	79	53	72	62	79	61	83	52	82	62	70	50	71	53	72	62	80.4	56.3
Johnstown.	78	64	76	52	72	53	85	67	83	57	76	56	75	64	74	48	78	68	78.0	54.7
Kennett Square.	75	60	72	54	72	53	69	53	62	57	78	62	76	60	79	63	86	78	78.0	54.7
Lebanon.	78	61	72	56	64	54	81	59	83	53	78	58	74	54	73	54	76	55	78.1	53.6
Le Roy.	67	52	70	48	67	53	80	58	77	53	78	52	66	48	67	45	64	52	73.6	52.2
Lewistown.	78	54	75	54	64	57	84	62	83	57	76	53	72	51	75	48	74	64	72.7	52.3
Lock Haven.	83	53	78	54	74	57	84	64	88	54	81	58	80	54	73	48	74	62	81.4	54.0
Lynchburg.	83	55	77	55	81	61	76	61	77	56	79	58	77	60	68	53	68	53	78.5	54.0
Mauch Chunk.	80	55	70	55	60	50	60	50	83	56	69	51	73	49	73	47	76	63	76.9	51.1
Philadelphia (a).	79	58	72	53	69	50	82	58	83	66	79	62	75	63	75	59	70	63	76.7	57.6
Philadelphia (b).	77	65	72	54	68	51	84	67	85	64	78	61	78	60	78	67	80	67	77.3	57.8
Pittsburg.	78	62	81	60	76	62	78	64	81	62	79	58	70	55	69	55	71	58	78.8	59.6
Pottstown.	82	60	75	55	64	54	82	60	84	60	74	60	74	53	74	56	79	63	77.3	56.4

Quakertown, .....	80	58	72	71	65	49	82	64	82	52	78	51	73	51	74	48	77	55	77.0	51.0
Sagestown, .....	77	53	71	65	81	51	86	53	80	44	78	56	58	46	73	39	64	48	80.0	48.2
Salem, .....	85	60	87	59	84	55	86	53	80	52	87	51	72	46	83	54	70	55	76.5	51.1
Shiloh, .....	74	38	74	44	68	56	79	62	75	45	75	60	65	47	65	40	64	46	82.2	52.9
Shingle House, .....	71	42	77	48	67	56	75	62	77	44	76	53	64	47	67	42	65	51	78.1	47.2
Smithport, .....	70	52	70	49	71	60	75	55	70	55	75	53	65	45	70	50	67	52	75.3	49.5
South Eaton, .....	73	53	70	57	62	43	81	59	77	55	67	50	68	55	68	50	67	55	73.4	52.0
State College, .....	74	58	72	52	63	56	79	62	79	58	79	57	67	53	69	50	69	55	73.9	55.4
Swarthmore, .....	78	56	73	53	71	53	83	63	85	62	77	63	76	53	74	62	79	55	76.7	57.9
Towanda, .....	73	50	72	50	64	58	81	60	79	51	70	59	60	52	71	45	68	54	75.6	51.7
Uniontown, .....	76	62	80	58	78	58	86	58	81	57	78	62	76	52	69	56	72	67	78.7	55.1
West Chester, .....	75	63	73	53	65	52	82	57	82	62	78	62	73	57	73	54	72	63	76.7	57.1
Westtown, .....	74	61	71	53	65	51	82	56	81	63	78	58	72	58	72	50	76	60	75.3	55.8
Wilkes-Barre, .....	80	56	74	55	65	54	83	59	85	63	77	60	74	50	74	48	71	51	78.6	52.5
Williamsport, .....	74	55	70	56	64	57	81	62	80	56	73	56	70	50	72	58	70	55	74.2	54.6
York, .....	74	63	73	55	67	56	82	63	81	55	81	60	72	51	74	55	77	59	76.9	52.2

## Daily Precipitation for Pennsylvania, May, 1896.

Stations.	Day of Month.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>Delaware Basin.</b>																
Bethlehem.	.12	.01									.21	.03		†		.69
Birmingham.								†			†				.50	
Brookville.			1.04		.45						.07				.35	
Coopersburg.	.10	.43									.01				.37	
Coopersburg.	.63	.14			.10			†			.08				.09	
Doylesburg.											.22				.12	
Dyersburg.			.01					.07							.41	
Easton.	†			.05	†										.02	
Forks of Nechamy.			.06	.85	.05						.38				.18	
Fredrick.			.26		.04										.10	
Hamburg.			.21												.31	
Hamlin.			.65					.01			.02	.07		.08	.01	
Honesdale.																
Kennett Square.	†	.04	.15	.01				†							.07	
Lansdale.			.20								.07				.10	
Mauch Chunk.			.10					†							†	
Ottville.			.16								.33				.25	
Philadelphia (a).	†	†	1.09	†	.07						.06				.28	
Philadelphia (b).	†	†	.23	†	.07						.01			†	.50	
Point Pleasant			.51					.07								
Pottstown.			.58												.28	
Quakertown.	†	†	.17		†			†			†	.44		†	.44	
Reading.		.15	.74			.03									.40	
Seisoltville.	.20				.10						.14	.16			.16	
Shawmont.			.85		.03						.04				.21	
Smiths Corner.			.25		.03										.30	
Swarthmore.			.28												.42	
West Chester.	.06	.01	.27		.04										.18	
Westtown.	.02	.01	.15		.05						†	†			.33	
White Haven.		†						†			†	†			†	
<b>Susquehanna Basin.</b>																
Altoona.			.73					.04	.02			.15	.52	.03		
Aqueduct.			.16									.06			.71	
Carlisle.			.12						.21			.10	.02			
Centre Hall.	.20															
Easton.			.08		.08						†	.21		.22		
Gettysburg.			.10													
Gladesville.																
Grandville.	.06										.02					
Grampian.	.21											.15		.35	.10	

Harrisburg.	↑	.17	.09	.10	.04	.21	↑	↑	.01
Hollidaysburg.		.23	.16			.34	.04	↑	.21
Huntingdon.			.04		.48	.18		.32	
Lancaster.		.22	.22		↑	.02			.04
Lebanon.		.24	.23		↑				↑
Le Roy.	.65	.07			.12				
Lewistown.		.11			.12				
Lock Haven.					.03				
Sellersburg.			.07		.03	.30	.02		
South Eaton.		.06			.12				
State College.	↑	↑	↑		.06	.08	.15		
Towanda.					.13	.04			
Wellsville.					.02	.03			.01
Wilkes-Barre.					.28		.15		
Williamsport.	.03	.03	.03		.17		.03		
York.	.02	.30	.16	.18	↑	.05	↑	↑	
<b>Ohio Basin.</b>									
Beaver Dam.									
Brookville.			.12				.13	↑	.06
Cannonsburg.	.15	.10				.40	↑	↑	.15
Cassandria.		.02	.12		.05	.13	.61		.01
Confluence.		.05	.20	.09		.01	.17	.04	.01
Davis Island Dam.	.01		1.32		↑	.02	.33	.02	.01
Du Bois.			.50			.19			
Elwood Junction.	↑		.98			.33	.75	.03	
Freepport.	.02		1.90			.05	.07	↑	↑
Greensboro.	.29	↑	.15	.05					
Greenville.							.02	.02	
Johnstown.	↑	.10	.14		.01	.04	.49	↑	
Lock No. 4.	.10	↑	.91			.13	.41		
Lycipus.		.07	.77	↑		.02			
Oil City.	↑								
Parker's Landing.	.06		.98			.32	.16	.01	.02
Pittsburg.	.01	.28	.39			.58	1.01	.23	.04
Ridgway.			.46	.05		.16			
Sagerstown.	↑		.28			↑			
Shingle House.		.05					.25		
Smithport.						.10	.36		
Somers.						.11	.40		
Tonawanda.	↑	.10							
Uniontown.	↑	.20	.11	.40		.05			
Warren.	↑	↑	.33	.22		.01	.02		.15
West Newton.	.07	↑	.33			.15	↑	.46	.03
<b>Potomac Basin.</b>									
Chambersburg.			.06	.02	↑				
<b>Lake Basin.</b>									
Erie.	.02	.50	.02	↑		↑			.01

↑ Trace, when precipitation is less than 0.01 inch.

\* Precipitation included in that of following day.

## Daily Precipitation for Pennsylvania, May, 1896.

Stations.	Day of Month.																Total.
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Delaware Basin.																	
Bethlehem.	.01	.05	.19	.05	.77	.01	.01	.01	.37	.46	.01	.45	.01	.01	.57	6.30	
Blooming Grove.	.01	.19	.05	†	.69	.01	.01	.01	.01	.58	.01	.44	.01	.01	.82	2.98	
Brown's Lick.	.08	.27	.14	.45	.08	.01	.01	.01	.01	.25	.01	.24	.01	.01	.50	4.11	
Coatesville.	.13	.37	.37	.22	.71	.01	.01	.01	.01	.10	.01	.10	.01	.01	.25	2.58	
Coopersburg.	†	.19	.22	.22	.71	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	4.41	
Doylesville.	.01	.20	.19	.19	.40	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.72	
Dyersburg.	.01	.01	.01	.01	.40	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.72	
Easton.	.01	.01	.01	.01	.40	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.72	
Forks of Neshaminy.	.06	.08	.10	.10	.48	.01	.01	.01	.01	.16	.01	.75	.01	.01	.04	2.72	
Frederick.	.04	.41	.18	.18	.70	.01	.01	.01	.01	.35	.01	.30	.38	.01	.67	4.96	
Hamburg.	†	.26	.10	.10	.56	.04	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.40	
Hamlington.	.10	.26	.10	.10	.56	.04	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.40	
Honesdale.	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.02	
Kennett Square.	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.02	
Laurel.	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.02	
Mauch Chunk.	†	.41	.24	.24	.56	.01	.01	.01	.01	.14	.01	.01	.01	.01	.01	2.72	
Ottville.	.01	.22	.22	.22	.56	.01	.01	.01	.01	.14	.01	.01	.01	.01	.01	2.72	
Philadelphia (a).	.04	.22	.22	.22	.56	.01	.01	.01	.01	.14	.01	.01	.01	.01	.01	2.72	
Philadelphia (b).	.04	.22	.22	.22	.56	.01	.01	.01	.01	.14	.01	.01	.01	.01	.01	2.72	
Point Pleasant.	.16	.26	.26	.26	.56	.01	.01	.01	.01	.14	.01	.01	.01	.01	.01	2.72	
Port Jervis.	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	2.01	
Quakertown.	†	.21	.17	.17	.74	.02	.01	.01	.01	.15	.01	.85	.03	†	.13	2.91	
Reading.	.01	.10	.11	.11	.41	.01	.01	.01	.01	.22	.01	.78	.02	.01	.01	4.00	
Scranton.	.01	.10	.11	.11	.41	.01	.01	.01	.01	.22	.01	.78	.02	.01	.01	4.00	
Seelyville.	.01	.10	.11	.11	.41	.01	.01	.01	.01	.22	.01	.78	.02	.01	.01	4.00	
Shawmont.	.01	.10	.11	.11	.41	.01	.01	.01	.01	.22	.01	.78	.02	.01	.01	4.00	
Smiths Corner.	.01	.10	.11	.11	.41	.01	.01	.01	.01	.22	.01	.78	.02	.01	.01	4.00	
Swarthmore.	.01	.10	.11	.11	.41	.01	.01	.01	.01	.22	.01	.78	.02	.01	.01	4.00	
West Chester.	.01	.10	.11	.11	.41	.01	.01	.01	.01	.22	.01	.78	.02	.01	.01	4.00	
Westtown.	.01	.10	.11	.11	.41	.01	.01	.01	.01	.22	.01	.78	.02	.01	.01	4.00	
White Haven.	†	.08	.08	.30	.31	.02	.01	.01	†	.02	.01	.15	.15	†	.15	2.78	
Susquehanna Basin.																	
Altoona.	.01	.19	.07	.07	.18	.01	.01	.01	.01	.25	.01	.25	.02	.01	.18	2.70	
Aqueduct.	.01	.19	.07	.07	.18	.01	.01	.01	.01	.25	.01	.25	.02	.01	.18	2.70	
Carlisle.	.15	.24	.51	.51	.23	.01	.01	.01	.01	.47	.01	.60	.01	.01	.01	2.92	
Centre Hall.	.10	.10	.10	.10	.27	.01	.01	.01	.01	.11	.01	.22	.01	.01	.01	2.09	
Emporium.	.10	.10	.10	.10	.27	.01	.01	.01	.01	.11	.01	.22	.01	.01	.01	2.09	
Gettysburg.	.03	.02	.28	.36	.16	.01	.01	.01	.01	.106	.01	.12	.12	.12	.32	3.36	
Girardville.	.03	.02	.28	.36	.16	.01	.01	.01	.01	.106	.01	.12	.12	.12	.32	3.36	
Granplan.	.03	.02	.28	.36	.16	.01	.01	.01	.01	.106	.01	.12	.12	.12	.32	3.36	



## CLIMATOLOGY OF THE MONTH.

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General Characteristics.

The rainfall deficiency and cool nights retarded the rapid growth of crops during the first week in June. From and after that time a sufficiency of rainfall occurred and crops made rapid progress. Haying began during the second week, and by the end of the month considerable wheat had been cut, and cultivated crops were in good condition. A slight deficiency of temperature for the month occurred in nearly all sections. The rainfall for the month was unevenly distributed, being from two to six inches in the eastern counties, and from four to eight inches in the western. Some of the excessive rains caused local damage to crops. A few frosts occurred, but they were not damaging.

## Atmospheric Pressure.

The mean pressure for the month, 29.99, is normal. At the United States Weather Bureau stations the highest observed was 30.29 inches, at Harrisburg on the 3d, and the lowest, 29.55 inches, at Philadelphia on the 10th.

## Temperature.

The means of the daily maximum and minimum temperatures, 78.3 degrees and 56.5 degrees respectively, give a monthly mean of 67.4 degrees, which is 2.3 degrees below the normal, and 4.0 degrees below the corresponding month of 1895.

The average daily range was 21.8 degrees.

The highest monthly mean was 71.8 degrees, at Swarthmore.

The lowest monthly mean was 62.6 degrees, at Shingle House.

The highest temperature recorded during the month was 98 degrees, on the 20th at Aqueduct.

The lowest temperature was 32 degrees, on the 2d at St. Marys, and 3d, at Shingle House.

The greatest local monthly range was 56 degrees, at Shingle House.

The least local monthly range was 37 degrees, at Erie and Philadelphia Weather Bureau stations.

The greatest daily range was 50 degrees, at Shingle House.

## Precipitation.

The average precipitation for the month, 4.64 inches, is 0.90 inches more than the normal.

[REDACTED]



1980

STATE BOARD OF HEALTH.

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The largest total rainfall, in inches, were: Indiana, 9.11; Altoona, 8.48; Huntingdon, 7.74; St. Marys, 7.47; Hollidaysburg, 7.38; Chambersburg, 7.19. The least were: Dyberry, 1.89; Scranton, 1.98; Hamlington, 2.01; Towanda, 2.17; Wilkesbarre, 2.40; Blooming Grove, 2.49.

#### Wind and Weather.

The prevailing wind was from the west.

Average number of rainy days, 11; clear, 10; partly cloudy, 11; cloudy, 9.

#### Miscellaneous Phenomena.

Thunderstorms.—3, 4, 5, 6, 7, 8, 9, 10, 13, 16, 17, 18, 20, 21, 22, 24, 26, 28, 29.

Hail.—East Mauch Chunk, 17; West Chester, 17; South Bethlehem, 20; Somerset, 5; Wellsboro, 7.

Frost.—Towanda, 3; Quakertown, 1, 2, 3; Cassandria, 1, 2, 3, 11, 12; Johnstown, 1, 2; Grampian, 1, 2, 30; White Haven, 2; Williamsport, 3; Smethport, 1, 11; Shingle House, 3, 30; Somerset, 1, 2, 11; Wellsboro, 1, 2, 3, 11, 30; Canonsburg, 1, 2, 11.

Aurora.—Quakertown, 11.

*Climatological Data for Pennsylvania, June, 1896.*

Country.	Stations.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.				Precipitation, in Inches.				Sky.				Prevailing direction of wind.			
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Great in twenty-four hours.	Total snowfall (un-melted.)	Number rainy days.		Number clear days.	Number partly cloudy days.	Number cloudy days.
Adams.	Gettysburg.	812	36	70.5	-0.5	89	25	47	2	27	4.79	+1.20	0.96	15	6	21	3	NW	
Allegheny.	Pittsburg.	380	5	60.0	-2.6	93	21	44	3	35	4.03	-1.50	1.19	9	4	19	7	W	
Berks.	Hamburg.	280	8	69.5	-1.8	86	20	45	11	34	5.48	-3.68	1.97	13	15				
Berks.	Reading 2.	1,181	8	61.8	-1.9	86	20	37	2	43	5.28	+3.13	1.89	13	10	9	8	W	
Blair.	Altoona 41.	1,917	8	61.8	-4.1	88	8	45	3	33	2.95	-1.81	0.88	10	16	8	8	NW	
Bradford.	Hollidaysburg C.	1,400	7	64.2	-3.1	90	20	55	3	41	4.47	-0.34	1.15	10	16	10	10	NW	
Bradford.	Le Roy.	304	7	69.8	-0.9	89	20	41	3	36	6.31	-0.34	1.15	10	16	10	10	NW	
Bucks.	Towanda.	278	21	66.4	-1.9	92	31	40	3	37	3.03	-0.34	1.15	10	16	10	10	NW	
Bucks.	Orks of Neshaminy 1.	208	26	68.1	-1.9	92	31	40	3	37	3.03	-0.34	1.15	10	16	10	10	NW	
Camden.	Quakertown.	2,100	8	68.6	-1.9	92	30	38	2	36	6.31	-0.34	1.15	10	16	10	10	NW	
Camden.	Chambersburg.	1,184	8	61.8	-5.8	89	20	40	2	40	6.03	-1.26	1.70	11	8	15	14	NW	
Carbon.	Johnstown.	1,020	8	61.8	-5.8	89	20	40	2	40	6.75	-1.82	2.10	11	12	13	12	NW	
Carbon.	East Mauch Chunk.	1,591	8	66.2	-3.4	91	21	41	2	40	5.52	-1.50	1.54	11	14	8	14	NW	
Centre.	State College.	1,191	8	61.6	-2.7	86	20	42	2	31	5.02	-0.32	0.74	14	7	9	14	W	
Centre.	Centre Hall.	66.2	45	66.2	-0.6	87	20	41	3	36	4.06	-1.49	2.63	12	15	6	9	W	
Chester.	West Chester.	455	40	65.9	-0.6	89	20	50	2	27	5.81	-1.49	2.63	12	15	6	9	W	
Chester.	Chester.	285	8	68.0	-2.5	91	30	43	3	36	2.85	-1.61	0.67	11	18	5	8	NW	
Chester.	Kenett Square.	370	6	68.3	-2.1	91	30	43	3	35	5.11	-1.96	1.27	12	12	10	8	NW	
Chester.	Westtown.	350	31	66.6	-0.4	84	20	40	3	36	5.76	-1.72	1.67	13	3	15	12	W	
Clearfield.	Gramplan.	1,470	8	68.6	-2.1	93	8	41	3	42	4.31	-0.14	1.79	9	11	12	7	W	
Clinton.	Lock Haven.	560	4	64.5	-3.1	90	5	35	2	46	6.97	-3.65	1.75	12	7	11	12	NW	
Crawford.	Faegerstown.	1,260	4	64.5	-3.1	90	5	35	2	46	6.97	-3.65	1.75	12	7	11	12	NW	
Cumberland.	Carlisle.	430	8	68.8	-2.1	91	21	45	3	75	4.27	-0.90	1.00	11	12	11	7	W	
Cumberland.	Dauphin.	361	8	69.0	-2.3	89	20	50	3	27	3.82	-0.07	0.92	11	9	11	10	W	
Cumberland.	Swarthmore.	190	7	71.8	+0.5	91	20	50	16	27	4.91	-0.25	2.20	9	8	13	9	W	
Delaware.	St. Marys, 1 <sup>a</sup> .	7	61.6	82	5	33	2	7.47					2.70	10	7	15	8	W	
Delaware.	Edinboro <sup>91</sup> .	1,220	7	61.9	-2.2	85	25	43	1	22	4.67	-0.65	1.02	11	17	13	13	W	
Erie.	Erie.	1,400	25	66.2	-1.0	84	8	47	2	32	4.67	-0.65	1.02	11	16	13	6	NW	
Erie.	Uniontown.	681	8	69.0	-2.9	88	20	43	11	30	3.12	-2.00	0.79	15	12	12	6	W	
Erie.	Chambersburg b.	1,000	4	67.8	-1.8	90	20	42	2	36	7.19	+3.05	1.52	13	7	7	14	W	

Huntingdon.	Huntingdon.	650	8	67.5	-2.0	90	20	31	2	41	7.74	+3.49	1.71	15	12	11	7	W
Indiana.	Indiana.	1,350	3	69.6	+0.1	92	27	31	2	34	9.11	+4.79	5.30	13	6	13	10	W
Lackawanna.	Lackawanna.	741	...	...	...	89	20	44	3	34	1.84	...	...	6	11	9	10	W
Lancaster.	Lancaster.	413	8	70.4	-1.0	89	23	43	2	33	...	...	...	15	14	5	11	SW
Lebanon.	Lebanon.	468	8	67.4	-2.7	81	21	41	3	33	...	...	...	15	16	6	8	W
Lehigh.	Lehigh.	529	6	67.6	-2.3	88	21	47	1	33	4.51	1.28	...	15	14	5	11	SW
Luzerne.	Coopersburg.	1,250	6	68.0	-2.3	98	21	53	21	37	3.83	+0.49	1.82	11	8	15	7	NW
Luzerne.	White Haven.	575	6	68.7	-2.9	84	20	40	3	41	2.40	1.72	1.93	9	16	11	6	W
Lysening.	Wilkes-Barre.	1,380	5	66.8	-3.0	88	20	43	3	41	2.40	+0.72	1.29	19	14	11	5	W
McKean.	Williamsport.	1,340	6	61.0	-2.7	86	7	34	3	41	5.38	+0.82	1.22	12	8	13	9	SW
Montgomery.	Smithport.	1,170	8	70.0	-2.8	92	21	48	3	32	3.01	-0.26	0.75	7	16	7	11	W
Northampton.	Pottstown.	339	19	70.9	-2.3	89	21	58	25	32	3.69	-0.70	...	...	16	4	7	W
Northampton.	South Bethlehem.	325	12	68.6	-2.3	90	21	46	15	29	2.93	-0.34	1.16	11	12	7	11	SW
Perry.	Easton.	317	7	70.4	-2.4	98	21	47	2	33	4.85	-1.54	0.52	14	8	11	11	SW
Philadelphia.	Aqueduct.	117	24	70.3	-1.7	91	20	54	3	25	4.05	-0.92	1.12	11	9	12	9	SW
Philadelphia.	1225 Centennial avenue.	120	5	70.6	-2.8	92	20	51	3	25	5.30	-2.28	2.58	12	9	12	9	SW
Pike.	Blooming Grove.	8	61.0	-4.4	88	20	38	3	38	2.43	+2.31	0.91	...	11	1	20	9	NW
Potter.	Shilling House.	1,477	...	...	...	88	7	32	5	60	3.96	...	0.75	8	7	14	9	W
Snyder.	Selling Grove.	4.5	7	66.8	-4.4	85	8	40	2	49	2.49	-1.74	0.74	7	...	22	8	SW
Somerset.	Somerset.	2,210	8	73.4	-4.6	86	20	35	2	39	7.68	+0.02	2.20	14	5	14	11	SW
Tioga.	Wellsville.	1,327	8	60.2	-4.2	86	20	34	3	39	3.92	-0.91	1.35	11	15	2	13	N
Tioga.	Lewisburg.	460	6	60.6	-4.4	91	21	39	2	38	4.70	-0.08	1.59	11	13	8	9	N
Washington.	Cannonsburg.	596	22	70.0	-1.6	83	7	50	2	27	6.71	+3.23	1.20	11	8	12	3	W
Wayne.	Dyersburg.	1,100	39	62.8	-1.5	83	7	31	3	46	1.81	-1.19	0.77	8	14	11	3	W
Wayne.	Honesdale.	1,000	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wayne.	Hamorton.	1,600	7	6.6	2.1	88	20	47	3	30	2.01	-1.83	0.47	11	6	10	11	W
Westmoreland.	Lycippus d.	1,450	7	70.4	-1.1	87	21	48	1	37	3.88	+1.15	1.02	12	...	...	...	...
Wyoming.	South Patton.	660	8	66.1	+3.0	85	20	38	3	36	2.62	-0.39	0.75	10	15	9	6	NW
York.	York.	385	8	65.1	-2.6	91	21	42	2	35	3.82	+0.33	0.96	11	10	10	10	W

Location of instruments changed June 1.  
 Extremes of temperature from observed readings of dry thermometers.

1 mean of 7 a. m. to 4 p. m. +0.9.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.  
 A Roman letter following the name of a station, or placed against the data in the body of the form, indicates the number of days missing from the record.  
 For instance, "B" denotes 14 days missing.



Baerstown.	65	37	35	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Scranton.	67	45	48	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11
Sellingrove.	71	51	54	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Shingle House.	63	41	44	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7
Smithport.	62	40	43	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6
Souderton.	73	36	38	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	
Somersett.	63	38	40	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4
South Patton.	63	38	40	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4
State College.	67	46	49	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	
St. Marys.	71	55	57	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	
Swarthmore.	71	55	57	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	
Towanda.	64	44	47	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	
Uniontown.	70	45	47	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	
West Chester.	70	51	53	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	
Westtown.	68	44	47	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12		
Wilkes-Barre.	68	44	47	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12		
Williamsport.	66	45	49	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	
York.	71	47	50	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	

## Maximum and Minimum Temperatures for Pennsylvania, June, 1896.—Continued.

Stations.	11.		12.		13.		14.		15.		16.		17.		18.		19.		20.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	76	45	81	51	68	55	68	55	74	55	75	58	76	54	80	54	84	55	86	55
Aqueduct.	80	52	89	62	72	59	67	56	78	55	79	57	84	60	88	58	89	59	98	65
Blooming Grove.	70	42	75	48	67	54	61	46	73	47	71	62	75	58	81	58	86	62	88	66
Cannonsburg.	77	55	80	56	74	61	73	62	74	51	72	64	75	58	80	60	87	60	90	65
Carlisle.	82	52	70	58	79	56	76	52	75	51	74	59	81	61	85	58	87	60	93	62
Casandria.	72	55	77	63	59	66	65	56	71	50	73	57	80	57	83	53	86	63	87	64
Center Hall.	78	48	84	53	80	56	67	56	71	50	73	57	80	57	84	58	86	58	91	61
Chambersburg.	82	45	83	49	74	56	67	57	76	47	63	56	80	61	80	62	86	59	91	64
Coatesville.	77	50	81	60	70	59	64	57	71	48	63	59	77	60	80	68	83	62	86	59
Coopersburg.	66	43	76	42	70	41	58	52	72	39	70	50	80	57	82	62	85	60	88	59
Dyberry.	76	51	82	55	70	56	72	56	75	46	75	60	80	60	83	62	85	60	87	66
Easton.	75	41	80	41	79	50	72	57	74	52	72	58	74	64	82	54	82	51	84	58
Emporium.	67	55	73	57	72	58	69	56	72	55	66	58	71	57	74	57	80	60	81	60
Erie.	78	50	72	52	64	58	70	58	76	56	78	60	80	56	84	54	84	58	82	62
Gettysburg.	70	49	85	56	68	62	57	58	78	45	63	60	82	62	85	60	89	59	91	65
Hamburg.	71	49	75	56	68	51	58	51	74	46	69	58	77	59	83	70	86	60	88	60
Hamilton.	78	45	83	58	80	50	67	59	71	51	71	59	77	59	81	61	85	62	86	68
Harrisburg.	79	43	86	48	66	52	70	54	76	51	74	59	80	53	84	56	86	54	91	58
Hollidaysburg.	79	43	86	48	66	52	70	54	76	51	74	59	80	53	84	56	86	54	91	58
Honesdale.	79	44	84	48	73	53	70	45	75	45	75	58	81	56	81	58	84	59	86	60
Huntingdon.	74	49	79	46	81	61	67	57	82	58	76	65	78	58	82	70	86	60	88	60
Indiana.	77	45	82	46	73	57	72	47	77	45	60	53	83	57	83	57	88	60	90	60
Johnston.	79	47	83	52	76	57	67	55	76	45	61	55	79	60	82	62	87	60	91	61
Kennett Square.	80	56	83	53	76	51	76	52	81	45	65	55	79	60	82	62	87	60	91	61
Lancaster.	79	46	81	53	78	51	76	52	81	45	65	55	79	60	82	62	87	60	91	61
Lebanon.	68	46	73	58	73	58	70	59	74	47	65	58	70	61	84	60	86	59	90	62
Le Roy.	80	45	85	51	72	49	61	53	73	47	70	60	80	55	78	56	87	59	88	64
Lewisburg.	82	50	86	52	83	55	72	50	80	45	70	60	80	55	88	56	87	54	91	62
Lock Haven.	73	49	74	56	79	57	65	54	77	47	78	55	85	57	88	59	89	56	92	62
Lycippus.	79	41	83	49	66	51	66	56	78	41	67	60	78	51	78	57	83	62	86	68
Mauch Chunk.	79	57	82	62	78	62	62	56	78	51	64	58	74	61	82	64	86	68	91	70
Philadelphia (a).	80	55	84	60	77	65	68	55	76	51	67	62	78	55	80	61	84	64	87	68
Philadelphia (b).	78	53	81	56	66	54	76	58	77	54	76	62	78	55	80	61	84	64	87	68
Pittsburg.	80	52	84	60	76	62	68	60	76	52	66	60	81	63	85	63	88	62	91	67
Pottstown.	78	45	83	51	75	54	64	54	77	42	64	56	80	58	84	59	88	56	91	61
Quakertown.	78	45	83	51	75	54	64	54	77	42	64	56	80	58	84	59	88	56	91	61

Sageertown.	73	41	80	42	77	47	71	45	77	43	75	52	76	50	83	47	85	47	87	57
Seranton.	73	45	77	57	73	51	66	50	75	44	75	62	82	73	70	83	79	71	90	65
Sellingrove.	84	45	86	48	82	48	84	59	74	51	82	68	80	79	84	73	90	59	89	62
Shingle House.	70	38	77	33	74	43	73	45	76	41	73	55	76	40	80	52	84	48	84	56
Shetfort.	72	38	78	42	75	46	78	54	72	47	72	54	74	50	81	51	84	51	86	54
Smethport.	70	34	76	42	73	44	65	42	72	45	73	50	70	53	75	51	85	52	85	52
South.	73	50	75	54	73	51	65	51	71	51	70	60	77	59	80	59	83	55	85	61
State College.	75	49	80	56	70	54	65	54	72	52	73	58	77	53	73	52	83	56	86	61
State College.	75	44	80	56	70	54	65	54	72	52	73	58	77	53	73	52	83	56	86	61
St. Marys.	81	57	82	61	83	67	78	67	77	50	65	63	77	67	83	66	87	71	91	71
Swarthmore.	81	57	82	61	83	67	78	67	77	50	65	63	77	67	83	66	87	71	91	71
Towanda.	73	46	78	49	76	46	67	57	76	46	76	58	80	58	81	56	87	51	90	62
Uniontown.	73	43	80	50	63	56	76	57	78	60	78	57	77	51	80	54	81	60	88	63
West Chester.	78	51	80	58	75	63	67	56	73	50	65	57	75	61	80	61	84	64	89	69
Westtown.	80	45	85	50	79	53	68	53	78	42	74	50	85	60	87	57	92	57	94	65
Wilkes-Barre.	76	49	80	54	74	55	66	59	73	48	70	61	79	57	83	57	85	57	88	62
Williamsport.	79	47	83	51	72	57	67	59	74	50	70	59	80	61	82	56	86	59	90	64
York.	79	47	83	51	72	57	67	59	74	50	70	59	80	61	82	56	86	59	90	64



*Maximum and Minimum Temperatures for Pennsylvania, June, 1896.—Continued.*

Stations.	21.		22.		23.		24.		25.		26.		27.		28.		29.		30.		31.		Monthly mean.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	86	62	84	63	76	62	63	56	66	56	84	62	71	53	80	59	77	53	80	46	.....	.....	77.6	57.3
Aqueduct.	97	64	91	67	81	61	62	57	68	56	90	62	85	61	84	61	84	59	82	46	.....	.....	81.7	59.3
Bloomington.	86	68	83	66	76	56	68	66	72	60	84	62	82	62	72	57	76	56	80	44	.....	.....	75.6	54.3
Cannonsburg.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80.2	57.5
Carlisle.	94	68	92	68	73	59	61	56	65	54	84	62	78	61	79	68	76	55	79	60	.....	.....	77.7	63.4
Cassandria.	80	64	81	67	68	56	64	60	77	60	83	63	78	60	81	61	75	58	82	49	.....	.....	75.1	59.4
Center Hall.	89	63	86	65	71	53	68	51	62	53	87	63	78	54	50	59	77	54	82	49	.....	.....	78.7	53.8
Chambersburg.	91	63	88	67	70	57	67	58	66	54	84	61	78	61	81	75	81	58	80	48	.....	.....	73.6	55.9
Coatsville.	88	69	86	68	74	61	62	55	61	54	82	63	79	63	79	69	81	58	80	48	.....	.....	78.8	57.1
Coopersburg.	85	57	85	66	79	49	60	42	59	51	79	58	79	48	72	55	77	53	74	42	.....	.....	75.5	50.0
Dyberry.	90	67	88	67	86	59	73	52	64	51	83	60	81	61	81	64	80	58	80	46	.....	.....	79.5	57.7
Easton.	86	62	82	61	74	46	61	51	67	56	81	61	78	53	76	55	75	55	77	43	.....	.....	76.9	52.7
Emporium.	78	56	73	67	69	15	72	60	83	61	74	67	78	59	72	69	70	59	73	51	.....	.....	73.3	39.2
Erie.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gettysburg.	80	61	80	61	68	54	68	56	78	56	78	61	76	64	76	62	70	56	78	46	.....	.....	76.7	56.6
Gramplan.	92	61	90	69	77	60	61	55	65	55	85	62	82	62	79	61	81	59	81	52	.....	.....	79.6	58.3
Hamburg.	87	70	87	69	75	53	15	53	60	52	81	60	76	57	68	53	71	57	71	48	.....	.....	74.5	56.6
Harrisburg.	89	63	87	70	71	63	63	55	64	54	83	63	75	65	81	62	80	61	80	58	.....	.....	77.5	60.4
Hollidaysburg.	89	63	87	69	69	50	63	56	58	55	88	62	.....	.....	.....	.....	.....	.....	85	46	.....	.....	79.9	53.7
Honesdale.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huntingdon.	98	61	87	69	76	51	66	55	65	55	87	61	83	53	83	59	80	73	84	44	.....	.....	80.0	55.0
Indiana.	84	64	85	66	70	62	58	60	60	60	83	61	72	70	78	70	73	60	79	84	.....	.....	80.9	57.4
Johnstown.	86	68	85	66	70	52	16	62	82	60	84	64	78	54	54	58	80	51	82	50	.....	.....	80.1	57.9
Kennett Square.	90	66	89	67	78	59	68	58	64	54	84	64	84	64	81	64	84	80	80	72	.....	.....	79.3	57.3
Lancaster.	86	68	88	68	89	63	82	60	82	64	86	66	84	66	84	66	84	66	83	67	.....	.....	81.2	59.7
Lebanon.	91	64	88	68	73	59	67	54	61	53	84	62	78	57	79	61	81	51	78	49	.....	.....	74.2	56.7
Le Roy.	83	66	82	61	73	50	67	50	65	52	76	60	77	57	73	61	76	51	79	43	.....	.....	71.2	54.3
Lewisburg.	90	62	87	61	76	52	61	54	63	54	84	62	79	64	76	60	80	56	80	46	.....	.....	78.7	54.8
Lock Haven.	88	59	87	67	86	51	61	53	74	59	85	63	86	55	83	61	81	54	81	45	.....	.....	79.3	60.6
Lycippus.	87	61	85	66	72	50	74	62	82	62	86	68	82	56	81	64	80	60	76	53	.....	.....	79.0	61.5
Mauch Chunk.	91	69	86	61	77	51	69	51	62	52	85	63	80	56	73	69	83	61	78	41	.....	.....	74.6	62.0
Philadelphia (A).	92	72	86	71	78	64	66	56	64	56	80	62	80	57	77	63	84	61	79	59	.....	.....	79.6	61.5
Philadelphia (B).	86	66	84	68	70	61	64	57	64	50	83	63	77	64	77	63	86	63	83	51	.....	.....	80.0	61.0
Pittsburg.	86	66	84	68	78	60	62	63	63	59	83	63	83	63	82	66	77	63	83	51	.....	.....	78.9	60.3
Portown.	82	64	80	63	76	60	61	61	61	57	84	61	80	60	76	63	83	61	79	48	.....	.....	78.9	60.3
Quakertown.	82	62	89	61	76	57	61	52	64	52	83	60	81	53	75	59	84	58	79	48	.....	.....	78.7	54.0

Sacketstown.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2
Scranton.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	77.7	51.6
Sellingrove.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2
Shingle House.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	77.7	51.6
Smithport.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2
Somers.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	77.7	51.6
South Milford.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2
State College.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	77.7	51.6
St. Mary's.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2
Swanton.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	77.7	51.6
Townsend.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2
Uniontown.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	77.7	51.6
West Chester.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2
Westtown.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	77.7	51.6
Wilkes-Barre.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2
Williamsport.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	77.7	51.6
York.	80	61	81	68	78	77	75	53	86	56	85	65	79	59	76	48	74	48	80	38	.....	78.8	50.2

*Daily Precipitation for Pennsylvania, June, 1896.*

Stations.	Day of Month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
<b>Delaware Basin.</b>																
Bethlehem.							.06	†	.14	.36				.90		.53
Blooming Grove.							.18	†	.02	.04				.66		.30
Browers Lick.								.07		.35				1.16		.38
Coatesville.								.20	.31	.08				.67		.27
Coopersburg.						.03			.21	.17			†	1.12		.19
Doylestown.									.34	†				1.76		.20
Dyberry.							.35	.30						.29		.16
Easton.							.13		.40	.36				1.16		.20
Forks of Neshaminy.								†	.14	.41				2.16		.37
Frederick.									.30	.13			.15	1.02		1.19
Hamilton.									.15	.06			.19	.16		.05
Harrisburg.		.01					.16		.01					.22	.01	
Honesdale.																
Kennett Square.				.06				.10	1.27	.10			†	1.12		.94
Lansdale.								.08	.85					2.30		.41
Mauch Chunk.							.03			.02			.17	1.25		.19
Ottaville.						.34		.06	.18					1.31		.41
Philadelphia (a).							†		.50	.24				1.62		.40
Philadelphia (b).				†				.04	.76	.18				2.38		.14
Point Pleasant.								.70	1.03					1.72		.50
Pottstown.									.11	.50				.75		.36
Quakertown.							†		.03	.25			†	1.15		.40
Reading.								.01	.13	.10			.45	.14		.27
Rehobothville.									.36	.42				.68		.40
Shawmont.								.02	.18	.09				2.00		.41
Smith's Corner.								1.00	.06					1.39		.18
Swarthmore.										.67					2.20	
West Chester.								.12	.15	.08				.93		.54
Westtown.									†							
White Haven.							.23		†	†			.33	.11		.17
<b>Susquehanna Basin.</b>																
Altoona.				.80			1.97	.87	.96					.35	.12	1.16
Aqueduct.				.06				.06	.56	.12				.41	.25	.01
Carlisle.									.16	.32				1.60		.86
Center Hall.				.23		.45		.21	.17				.86	.36		.21
Emporium.			†				.63	.40	.48					.68		1.53
Gettysburg.																.64
Girardville.								.08		.02			1.00	.24		.12
Grampian.				.84			.55	.65		.22			.20	.48		

Harrisburg	06				14	22	27		36	34	†	92
Hollidaysburg	78				63				99	35		121
Huntingdon	120	†			51	16	13		70	70	10	115
Lancaster												
Lebanon	02				03	16	58		07	07		61
Le Roy					†	13	38		07	22		38
Lewistown					35	20	02		48	16		50
Lock Haven						25	15		•	78		88
Scranton				98			19					
Selinsgrove									13	57		
South Eaton					04	57	32		09	23		29
State College	49			30	25	22	09		68	23		
Towanda	†				†	23	32		†	19		
Wellboro				10	135	25		05		32		10
Wilkes-Barre				11	13				•	43		09
Williamsport					02	29	27		•	51		06
York					02	57	21	96	52	15		21
Ohio Basin.												
Heaver Dam	10				113	45	48			08		
Brookville	04	07	06		04	12	06		21	09	01	96
Cannonsburg	120	06	40	70	80				†	40		
Cassandria	48		27	26	16	32			67	20		135
Confluence	02				13	39	45			37	21	102
Davis Island Dam	41				60	39	04			66		12
Du Bois	43				95	131	47		15	07	23	06
Elwood Junction	39	34			113	33	06			17		
Freepport	06			72	70	35	20			20		05
Greenboro	08				10	60	03	62	10	90	15	05
Indiana	†				110				60	20	30	
Johnstown	31	31			06	06	06		56	17		140
Lock No. 4	05				24				21	02	†	
Lycippus	22	06	06	102	36	29	59		33	33	20	25
Can. City	09				16	132	68		16	36		04
Parker's Landing	17				97	49	02			05	†	11
Pittsburg	12	96	20	34	94	09	14		05	08		17
Ridgway	01				22	82	10		05	28		20
Raegerstown	20				100	79	12		27			20
Shingle House	†	47			65	72	12		45			45
Smethport	10				98	40	15		20	20		132
Somerset	106	60			35	22		20	25	33	28	239
St. Mary's	†	03	01	40	70	08			45	25		11
Uniontown	03	08		19	55	03	12			11		27
Warren	12				12	86	36					
West Newton	†				125	66	02			17		
Potomac Basin.												
Chambersburg					35	•	95		37	35		152
Lake Basin.												
Grie.					91	18	03					23

† Trace, when precipitation is less than 0.01 inch.

• Precipitation included in that of following day.

## Daily Precipitation for Pennsylvania, June, 1896—Continued.

Stations.	Day of Month.														Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
<b>Delaware Basin.</b>															
Bethle am.	.04	.01		.06	.02				1.35	.11		.04			3.60
Blooming Grove.	.39			†	†				.93	†		.26			2.49
Brower, Lock.	.03							.48	.60	.04		.18			3.51
Coatesville.	.01				.21			.71	.46	.01		.31			2.85
Coopersburg.	.39	†			.08			.72	.37			.07			3.45
Doyles town.	.27				.57			.29	.55			.10			4.07
Dyberry.								.50	.37	.06		.11	.01		1.89
Easton.	.01			†	.02			.65	.65	.05		.26			3.98
Forks of Neshaminy.	.22				.03			.71	.28	.05		.26			4.46
Frederick.	.62				.38			.65	.29	.09	.53	.20	.31		5.24
Hamburg.	.06				†			.63	.24			.36			4.03
Hamilton.	.29				.03	.03		.43	.47	.05	.06	.19			2.01
Honesdale.															
Kennett Square.	1.00				.08			.12	.13			.13	.06		5.10
Lansdale.	.46				.18			.56	.29			.45			5.57
Mauch Chunk.	1.35				1.37			1.54	.20	.03		.06			5.52
Ottaville.	.08							.66	.27	.06		.20			3.36
Philadelphia (a).	.21				.09			.14	.49	.03		.19	.15		4.07
Philadelphia (b).	.06				†			.14	.47	.03		.24	.40		5.30
Point Pleasant.	.62				.19			.89	.21	.02	.12				6.34
Pottstown.								.60	.30			.25			3.01
Quakertown.	.06				.22	†		.53	.14	.03		.19	.07		3.03
Reading.	.23	.02			.01			.50	.06			.15	.03		2.86
Scrantonville.								.59	.21	.58		.59			3.83
Shawmont.	.02							.20	.56			.19	.37		4.04
Smith Corner.	.51				.21			.57	.25	.03		.16			4.56
Warminster.	.65	.40						.63	.53			.66			4.90
West Chester.	2.63				.03			.28	.70	.02		.35	.01		5.84
Wilmington.															
White Haven.	.26				.57			1.82	.10			.24	†		3.83
<b>Susquehanna Basin.</b>															
Altoona.	.15		.04	†	.49			1.52	.57	.01		.15	†		8.48
Aqueduct.	.07				.32	.07		.98	.32			.24			4.86
Carlisle.	.37				.25			.68	.10	.09					4.71
Center Hall.					.46		.12	.90				.22			4.02
Emporium.	.35				.44			2.10		.10		.52	.10		6.76
Gettysburg.															
Girardville.					1.06			.39				1.12			5.14
Grampian.				.55	.24			1.67		.16			.04		5.76

Harrisburg.	.20	.03	.20	.78	.12	.04	.08	3.32
Holidaysburg.	.13	.67	.159	.42	.12			7.38
Huntingdon.	.09	.41	1.31	.34	.18			7.74
Lancaster.								
Lebanon.	.07	.25	.02	.64	.20	.15	1.28	4.51
Le Roy.	.45	.08		.64	.07		.36	2.66
Lewisburg.	.08	.95		1.69	.07		.53	4.70
Lock Haven.		.07		1.79			.33	4.33
Scranton.	.47			.63	.14		.19	1.98
Sellingrove.	.23	.19		.74	.11		.52	2.49
South Eaton.				.75	.15		.20	2.62
State College.				.72	.01		.22	5.02
Towanda.	.31	.67	.01	.80	.04	†	.10	2.17
Uniontown.	.50	.10		1.09	.14		.25	1.92
Wellboro.	.18	.06		1.09			.20	2.40
Wilkes-Barre.	.39			1.90			.52	3.98
Williamsport.	.33	†		.74	†	.02	.19	3.92
York.								
Ohio Basin.								
Beaver Dam.	.57	.39	.70	.28	.82		.05	6.07
Brookville.		.80	.40	1.40			†	4.42
Cannonsburg.		.05		2.80	.30	.08	.05	6.71
Cassandria.	†	.76		1.46	.22	.12		6.32
Confluence.	.12	.46		.51	.31			4.77
Davis Island Dam.	.13			.82	†	.07	.03	4.47
Du Bois.	.19			.36	.62	.12	.04	5.22
Elwood Junction.	.30	.03	1.10	.06	.42	.14		5.81
Freeport.				.53	.05	.06		3.81
Greensboro.	.38	1.60	.30	.50	.20	.17	.03	5.26
Indiana.				1.70	.42	.08	.12	2.11
Johnstown.		.54	.06	1.50	.70		.13	6.03
Lock No. 4.	.12		.35	.19	.56		.63	4.60
Lycippus.		.17		.85	.76			3.86
Oil City.	.06	.02	.38	1.77	1.06	1.19	.06	4.81
Parker's Landing.		1.13		.17	.44	.31		4.79
Pittsburg.		.83	†	.40	.23	.10	.02	5.77
Pittsburg.				.97				6.97
Edgeway.	.23	.01		.52	.52		.05	3.96
Shesaton.		.28		.73	.75			7.48
Shingle House.		.28		.95	.10		.30	4.07
Southport.	.20	.10	.33	2.20	.13	.25	.15	4.31
St. Mary's.		.80		2.70	.04	†	.06	7.19
Uniontown.	.15	.49	.02	.79	.02		.37	4.67
Warren.	.10		.60	.30	.78			
West Newton.	.33	.01	.37	.40	.68	†	.14	
Potomac Basin.								
Chambersburg.	.10		1.01	.95	.17	.75	.02	
Lake Basin.								
Erie.				.30		1.02	.06	

Trace, when precipitation is less than 0.01 inch.

Precipitation included in that of following day.

## CLIMATOLOGY OF THE MONTH.

## General Characteristics.

The mean temperature for July was about  $1.7^{\circ}$  above the average. The warmest periods were during the 2d, 13th, and 27th, and the coolest on the 17th and 18th. The rainfall was 2.59 above the normal. The greatest departures occurred in the southwestern portion of the State, where from 10 to 15 inches was recorded. Excessive rainfalls were local and frequent, causing washouts and overflows which were damaging to crops. The general conditions were favorable for the growth of crops, all of which made rapid progress, but the rainy conditions were unfavorable for the curing and housing of grain and hay. At the close of the month agricultural products were well advanced and the prospects excellent for good crops.

## Atmospheric Pressure.

The mean pressure for the month, 30.03 inches, is .03 above the normal. At the United States Weather Bureau stations the highest observed was 30.40 inches at Philadelphia on the 19th, and the lowest, 29.72 inches, at Harrisburg on the 15th.

## Temperature.

The means of the daily maximum and minimum temperatures, 82.6 degrees and 62.8 degrees respectively, give a monthly mean of 72.8 degrees, which is 1.7 degrees above the normal, and 3.7 degrees above the corresponding month of 1895.

The average daily range was 20 degrees.

The highest monthly mean was  $77.6^{\circ}$ , at Philadelphia Weather Bureau.

The lowest monthly mean was  $67^{\circ}$ , at Shingle House.

The highest temperature recorded during the month was  $98^{\circ}$ , on the 13th at Aqueduct.

The lowest temperature was  $40^{\circ}$  on the 17th at Smethport and Shingle House, and 21st at Confluence.

The greatest local monthly range was  $51^{\circ}$ , at Confluence.

The least local monthly range was  $32^{\circ}$ , at Erie and Philadelphia Weather Bureau stations.

The greatest daily range was  $46^{\circ}$ , at East Mauch Chunk.

## Precipitation.

The average precipitation for the month, 6.89 inches, is 2.59 inches more than the normal.











The largest totals of rainfall, in inches, were: Uniontown, 15.59; Lycippus, 12.94; Greensboro, 12.72; Lock No. 4, 12.35; Confluence, 12.11; West Newton, 11.46. The least were: Coatesville, 3.04; Philadelphia (Centennial Avenue), 3.21; Shawmont, 3.26; Philadelphia, Weather Bureau, 3.27; West Chester, 3.54; Reading, 3.92; York, 4.00; Chambersburg, 4.09.

#### Wind and Weather.

The prevailing wind was from the west.

Average number of rainy days, 14; clear, 10; partly cloudy, 11; cloudy, 10.

#### Miscellaneous Phenomena.

Thunderstorms.—3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 20, 21, 22, 24, 26, 27, 28, 29, 30.

Hail.—Scranton, 13; Wilkesbarre, 23.

Frost.—Cassandria, 17, 18.

Aurora.—Drifton, 7, 16.

Solar Halo.—Towanda, 8; Wellsboro, 8.

## Climatological Data for Pennsylvania, July, 1896.

Counties.	Stations.	Elevation, feet.	Length of record, years.	Temperature in degrees, Fahrenheit.					Precipitation, in inches.					Sky.			Prevailing wind, direction of			
				Mean.					Total.					Number clear days.				Number cloudy days.		
				Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest range.	Departure from the normal.	Greatest in twenty-four hours.	Total snowfall (unmelted).	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.				
Allegheny.	Pittsburg.	842	26	74.0	0	93	27	53	17	26	8.96	+4.03	1.41	.....	17	6	15	10	SW	
Berks.	Hamburg.	380	5	75.3	+2.5	93	3	53	1	37	6.00	+2.93	1.14	.....	11	3	17	11	W	
Berks.	Reading 2.	280	8	76.3	+3.1	93	3	53	1	37	3.92	-0.68	1.00	.....	14	.....	.....	.....	W	
Blair.	Altoona.	1,181	8	72.4	+0.5	91	27	48	18	31	5.35	+1.43	0.96	.....	16	.....	.....	.....	W	
Blair.	Holidaysburg.	947	8	72.0	+1.2	94	29	46	17	41	7.10	+3.69	1.54	.....	15	11	9	9	SW	
Bradford.	Le Roy.	1,409	7	70.4	+1.2	90	23	50	17	30	5.84	+2.29	1.14	.....	16	3	15	13	SW	
Bradford.	Towanda.	754	7	71.8	+1.2	92	2	47	17	40	4.57	.....	0.74	.....	15	12	12	7	W	
Bucks.	Forks of Nesquehanna.	304	7	76.1	+3.1	93	3	49	1	40	4.62	-0.32	1.74	.....	15	12	1	13	NW	
Bucks.	Quakertown.	536	21	73.6	+2.1	93	3	49	1	40	8.20	+3.66	2.01	.....	14	7	9	15	SW	
Cambria.	Cassandria.	2,100	.....	73.6	.....	90	2	52	18	32	6.75	.....	1.02	.....	19	10	14	7	NW	
Cambria.	Johnstown.	1,184	8	73.2	+1.8	94	27	50	17	40	8.45	-4.51	1.52	.....	20	8	9	14	S	
Cameron.	Emporium.	1,050	8	69.7	-0.5	87	2	45	17	34	5.11	+1.02	1.16	.....	12	16	7	8	W	
Carbon.	East Mauch Chunk.	1,550	6	72.5	-2.5	93	3	45	2	46	6.20	+1.56	1.66	.....	13	16	7	8	W	
Centre.	State College.	1,191	8	71.0	+1.6	90	27	50	18	30	5.56	+2.04	1.09	.....	14	9	9	13	W	
Centre.	Centre Hall.	455	8	72.2	.....	90	3	50	18	37	5.66	.....	1.12	.....	10	11	13	7	.....	
Chester.	West Chester.	455	40	75.4	+1.6	91	13	58	17	25	3.54	-1.49	1.57	.....	11	16	6	9	S	
Chester.	Coatesville.	380	8	75.3	+2.9	94	27	52	18	32	3.04	-3.04	0.98	.....	9	17	9	5	S	
Chester.	Kennett Square.	275	6	75.2	+2.9	92	13	54	18	32	4.44	-0.53	1.43	.....	13	13	8	10	NW	
Chester.	Westtown.	350	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Chester.	Grampian.	1,420	31	71.6	+0.6	90	2	50	17	36	8.83	+4.00	2.70	.....	17	3	17	11	SW	
Chester.	Lock Haven.	560	8	74.4	+4.1	95	3	50	17	40	5.75	-1.82	1.25	.....	13	11	10	10	W	
Crawford.	Saegertown.	1,200	4	69.1	+1.2	90	2	41	17	42	5.48	-2.92	1.25	.....	12	4	9	13	NW	
Cumberland.	Carlisle 1.	480	8	75.6	+3.7	95	27	56	10	34	4.64	-2.13	1.00	.....	13	12	5	8	S	
Dauphin.	Harrisburg.	361	9	74.0	+1.0	91	27	53	18	29	6.32	+1.77	1.72	.....	15	8	9	14	W	
Delaware.	Swarthmore.	190	7	.....	.....	87	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Elk.	St. Mary's 1.	68.4	.....	.....	.....	87	3	45	17	32	6.36	.....	1.10	.....	10	7	7	17	SW	
Erie.	Edinboro 1.	1,200	7	69.5	+0.1	88	2	50	17	22	5.50	-2.61	2.32	.....	13	10	8	8	S	
Erie.	Erie.	1,400	24	71.0	0	88	2	56	17	22	5.50	-2.61	2.32	.....	8	9	16	6	W	
Franklin.	Payette.	681	8	73.0	+1.2	91	26	56	1	32	15.59	+10.06	2.92	.....	16	13	11	7	SW	
Franklin.	Uniontown.	1,000	4	73.2	+1.2	94	27	49	18	33	4.09	-2.17	0.74	.....	14	7	9	15	W	
Franklin.	Chambersburg.	1,000	4	73.2	+1.2	94	27	49	18	33	4.09	-2.17	0.74	.....	14	7	9	15	W	
Huntingdon.	Huntingdon.	650	8	72.6	+1.9	94	27	47	17	35	4.63	+1.06	0.90	.....	14	14	5	11	W	

Indiana.	Indiana.	1,350	3	74.6	93	26	61	22	38	11.41	-7.88	1.79	8	3	6
Jefferson.	Brookville n.	741	10	72.4	93	3	47	17	38	4.81	-7.88	1.79	11	9	11 W
Lancaster.	Lancaster.	413	8	74.7	91	30	56	1	32	6.38	-1.74	1.27	13	9	1 W
Lackawanna.	Lancaster h.	458	8	72.8	91	27	51	17	33	6.38	-1.74	1.27	17	12	8 SW
Lebanon.	Lebanon.	520	6	74.3	90	3	54	17	27	8.46	-4.51	1.96	15	13	5 NW
Lehigh.	Coopersburg.	520	6	74.3	85	3	54	25	27	7.60	-2.65	2.66	16	10	4 NW
Luzerne.	Drifton a.	1,250	3	74.3	93	13	58	8	25	7.60	-2.65	2.66	11	4	8
Luzerne.	White Haven* 1.	575	6	74.3	94	3	50	17	38	6.30	-2.65	2.66	12	13	8 10 W
Luzerne.	Willkes-Barre.	575	6	74.3	94	3	50	17	38	6.30	-2.65	2.66	12	13	8 10 W
Luzerne.	Williamsport.	575	6	74.3	94	3	50	17	38	6.30	-2.65	2.66	12	13	8 10 W
Luzerne.	Smithport.	575	6	74.3	94	3	50	17	38	6.30	-2.65	2.66	12	13	8 10 W
McKean.	Pottstown.	1,500	6	68.1	88	3	40	17	42	7.19	-3.60	1.15	12	8	11 12 SW
Montgomery.	Pottstown.	1,500	6	68.1	88	3	40	17	42	7.19	-3.60	1.15	12	8	11 12 SW
Northampton.	South Bethlehem* 1.	339	19	77.2	94	27	55	17	32	6.30	-0.76	1.70	10	20	7 4 W
Northampton.	Easton.	325	12	74.8	91	13	55	1	31	6.13	-2.11	1.24	13	16	2 W
Perry.	Aqueduct.	387	7	77.0	96	13	51	18	31	10.28	-5.73	2.55	16	14	6 11 NW
Philadelphia.	Philadelphia.	117	24	77.6	93	13	51	17	23	3.27	-0.90	0.80	14	7	11 13 SW
Philadelphia.	1529 Centennial avenue.	120	8	77.8	95	13	59	17	25	3.21	-0.90	0.80	14	8	11 13 SW
Pike.	Blooming Grove.	1,475	8	71.2	88	3	50	17	28	5.80	-0.39	0.83	16	0	17 14 W
Potter.	Shingle House.	1,475	8	71.2	88	3	50	17	28	5.80	-0.39	0.83	16	0	17 14 W
Snyder.	Sellingsgrove.	455	7	71.8	93	12	47	18	39	6.36	-2.73	1.65	13	0	19 12 SW
Somerset.	Somerset.	2,500	8	67.7	87	2	45	19	34	10.55	-6.78	2.05	15	7	13 11 SW
Somerset.	Confluence.	1,327	20	72.6	91	3	40	21	33	12.11	-7.41	2.22	18	4	6 21
Tioga.	Wellborn* 1.	450	6	66.4	88	12	43	18	36	5.67	-2.63	1.50	13	13	3 15 8
Union.	Lewistown K.	450	6	72.8	93	27	50	17	36	5.63	-1.52	0.87	12	11	9 11 8 NE
Warren.	Warren.	938	22	73.4	87	30	46	17	30	6.38	-1.81	1.27	14	12	11 8 NE
Washington.	Cannonshurk h.	1,000	30	73.4	90	27	55	17	22	11.07	-6.94	2.80	14	8	12 9 SE
Wayne.	Dyersburg.	1,000	30	73.4	90	27	55	17	22	11.07	-6.94	2.80	14	8	12 9 SE
Wayne.	Honesdale.	1,000	30	73.4	90	27	55	17	22	11.07	-6.94	2.80	14	8	12 9 SE
Wayne.	Hamilton.	1,430	3	72.6	89	28	51	17	24	12.94	-8.47	1.81	15	14	9 8 SW
Westmoreland.	Lyndhurst d.	680	6	71.1	88	27	50	17	34	4.66	-1.43	0.70	15	17	8 6 W
Wyoming.	South Eaton.	385	8	71.6	94	27	51	17	30	4.00	-0.19	0.85	15	17	8 6 W
York.	York.	385	8	71.6	94	27	51	17	30	4.00	-0.19	0.85	15	17	8 6 W

\* Extreme of temperature from observed readings of dry thermometers.

1 Mean of 7 A. M. + 9 P. M. + 5 P. M. + 9 P. M. + 4.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers. A roman letter following the name of a station, or placed against the data in the body of the form, indicates the number of days missing from the record; for instance, "n" denotes 14 days missing.

*Maximum and Minimum Temperatures for Pennsylvania, July, 1896.*

Stations.	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.		11.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	86	57	88	57	86	63	80	63	79	70	79	64	73	63	70	61	81	61	81	62	86	57
Aqueduct.	90	65	92	70	92	68	87	67	92	68	90	69	78	62	78	52	87	81	88	77	92	66
Blooming Grove.	86	64	84	68	88	70	87	64	86	66	87	69	73	62	70	52	74	58	80	65	84	66
Brookville.	84	64	86	68	83	71	80	72	77	71	80	69	74	65	74	61	74	63	81	62	83	64
Cannonsburg.	90	56	91	62	92	62	88	67	87	60	88	68	82	64	68	58	83	83	85	83	91	62
Carlisle.	88	56	90	63	87	70	85	70	76	68	83	71	67	58	66	59	79	83	83	80	82	62
Casandria.	88	51	90	58	90	60	85	63	82	68	89	62	80	64	70	54	80	83	84	70	88	62
Center Hall.	88	55	88	58	90	62	86	64	84	68	86	67	82	65	67	57	85	83	83	53	88	60
Chambersburg.	86	54	88	56	93	62	85	67	88	73	88	71	83	68	74	63	85	83	83	68	88	62
Coatesville.	87	61	89	66	91	70	85	67	81	69	84	69	84	63	74	60	81	81	82	68	88	60
Confluence.	85	58	85	60	90	65	84	70	87	72	86	69	80	68	70	61	81	81	82	69	85	69
Coolersburg.	81	61	83	73	85	63	80	70	78	67	81	70	76	58	67	56	77	66	73	64	81	66
Darton.	86	55	86	60	90	63	88	69	88	72	88	67	83	66	75	60	82	84	85	67	87	69
Dyersburg.	84	50	87	55	87	55	87	69	80	67	82	67	72	59	74	62	80	80	82	52	85	55
Emporium.	81	64	88	67	80	69	79	71	69	66	76	61	69	58	74	61	70	80	78	64	81	67
Eric.	86	50	90	60	83	64	82	66	80	66	82	66	72	60	84	64	86	87	86	62	89	66
Franklin.	90	53	90	58	93	60	88	68	87	71	89	67	83	68	70	64	81	81	86	62	89	66
Hannburg.	80	59	90	66	89	67	83	66	79	70	79	64	71	65	67	61	71	71	83	61	86	67
Hamilton.	88	59	86	63	88	65	84	68	83	72	84	64	80	67	73	53	83	83	83	49	90	54
Hollidaysburg.	90	49	91	54	90	58	83	63	82	68	82	64	76	57	73	53	83	83	86	49	90	54
Honesdale.	89	55	90	56	91	59	85	63	83	67	81	63	80	64	73	51	82	83	85	50	89	60
Huntingdon.	91	51	92	58	88	64	86	66	87	67	87	67	71	61	78	62	85	85	87	51	88	58
Johstown.	85	54	87	55	91	64	85	67	87	67	87	70	81	76	78	63	86	86	83	70	89	68
Kennett Square.	87	55	87	60	88	62	81	60	80	62	84	66	80	61	63	60	83	81	83	59	88	68
Lebanon.	87	54	87	60	89	60	85	67	84	71	86	69	80	61	77	52	80	80	83	58	84	60
Le Roy.	86	50	89	62	88	64	84	66	80	66	84	62	70	77	72	52	80	84	83	58	84	60
Lewistown.	87	51	89	59	89	61	84	64	84	64	84	64	64	64	64	64	83	83	83	58	84	60
Lock Haven.	92	52	95	57	95	61	90	64	88	70	87	65	85	65	87	53	88	88	90	54	91	59
Lycopus.	89	60	88	69	83	68	77	70	83	66	76	67	81	60	69	54	79	81	78	64	85	63
Mauch Chunk.	90	48	90	45	93	47	85	60	86	60	87	62	80	66	70	67	87	87	88	73	89	72
Philadelphia (a).	85	63	87	66	90	68	80	70	88	76	85	72	81	69	72	61	83	83	83	72	89	70
Philadelphia (b).	86	61	87	64	92	68	87	70	90	74	86	72	83	72	73	61	83	83	83	72	89	70
Pittsburg.	88	62	91	63	87	70	84	71	77	65	69	69	73	61	70	53	71	71	84	63	87	62

Pottstown,	80	57	89	53	85	88	70	86	74	91	72	84	68	74	64	84	70	84	68	90	72
Quakertown,	89	49	88	53	85	89	66	88	70	89	69	83	66	72	67	85	61	86	66	89	68
Sagersstown,	87	45	90	50	87	61	85	61	80	83	84	79	77	76	46	77	57	84	57	86	62
Seranton,	88	50	99	56	83	86	63	82	70	82	63	77	64	78	60	80	52	86	40	89	63
Sellingrove,	86	60	87	63	86	65	60	92	64	92	64	90	50	74	47	82	58	90	54	92	65
Shingle House,	86	43	89	50	88	52	59	78	56	84	54	69	50	74	47	82	51	83	53	86	52
Smethport,	88	46	98	50	88	55	59	81	66	83	57	72	58	73	46	80	58	82	53	85	52
Somersset,	84	48	87	55	84	58	54	82	58	80	60	76	58	62	58	78	52	80	48	82	52
South Eaton,	85	51	85	57	87	65	63	81	70	80	62	75	58	73	63	77	63	82	57	85	67
State College,	84	54	86	60	86	63	65	81	69	78	64	73	63	69	54	79	58	87	54	85	64
St. Mary's,	49	.....	53	.....	57	.....	54	.....	67	.....	53	.....	57	.....	49	.....	59	.....	55	.....	58
Swarthmore,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Towanda,	89	49	90	55	82	86	62	82	72	85	61	75	61	78	50	82	58	84	54	86	60
Uniontown,	48	56	89	67	87	68	68	68	81	65	81	76	64	69	57	76	61	81	57	85	59
Warren,	82	54	77	56	80	59	83	58	84	66	78	82	51	74	51	54	54	82	56	81	55
West Chester,	84	60	86	61	59	68	69	85	73	86	71	80	65	72	62	82	64	81	71	87	70
Westtown,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wilkes-Barre,	91	53	92	58	84	89	64	84	67	85	63	79	65	75	74	84	60	90	60	90	86
Williamsport,	85	54	87	60	88	83	84	67	82	71	81	66	74	73	65	82	58	83	57	87	82
York,	86	59	87	61	90	84	69	84	71	87	70	83	68	69	62	76	62	79	58	87	68





Pottstown, .....	90	70	92	74	89	73	87	72	80	68	59	77	55	84	56	80	60	86	70	82	74	98	74
Quakertown, .....	91	62	91	64	87	69	88	67	79	65	77	50	41	85	50	83	51	83	61	85	82	98	74
Ragertown, .....	88	53	88	58	82	62	81	69	78	50	79	47	47	83	41	83	55	81	63	87	83	98	74
Scranton, .....	89	61	88	62	86	66	87	82	86	58	84	49	47	83	51	79	60	80	67	86	83	98	74
Sellingrove, .....	93	60	93	73	89	67	89	64	79	64	72	40	40	82	42	86	60	80	62	83	82	98	74
Shingle House, .....	86	49	87	55	82	64	79	64	70	50	72	33	33	80	44	75	58	85	62	85	81	98	74
Smethport, .....	86	50	88	56	84	66	80	65	72	53	73	40	40	80	44	79	58	85	62	85	84	98	74
Somerset, .....	84	54	84	60	78	60	80	62	70	50	75	35	35	80	65	78	45	75	64	74	80	98	74
South Eaton, .....	87	60	87	62	82	67	83	70	80	60	73	30	30	80	50	77	60	79	68	82	70	98	74
State College, .....	85	65	86	65	85	81	85	82	70	62	74	43	43	77	45	79	61	79	68	81	69	98	74
St. Mary's, .....	87	57	86	61	84	64	80	69	75	54	74	45	45	77	45	78	57	71	67	84	66	98	74
Swarthmore, .....	90	56	89	61	81	66	85	72	73	58	75	47	47	83	47	82	60	77	69	86	70	98	74
Towanda, .....	86	60	89	61	80	66	83	66	74	62	73	39	39	81	58	88	61	83	70	82	67	98	74
Uniontown, .....	82	55	86	58	86	63	82	68	79	53	71	46	46	80	54	80	54	80	60	76	65	98	74
Warren, .....	89	63	91	71	85	75	86	73	80	68	77	38	38	81	58	80	60	85	67	82	75	98	74
West Chester, .....	92	63	91	66	90	66	86	70	82	62	76	50	50	87	57	83	62	80	63	87	70	98	74
Westtown, .....	87	66	88	65	82	69	83	69	75	63	73	51	51	79	53	85	64	78	69	84	70	98	74
Wilkes-Barre, .....	89	65	90	69	84	71	85	71	80	68	76	51	51	83	53	82	58	90	69	81	72	98	74
Williamsport, .....	87	66	88	65	82	69	83	69	75	63	73	51	51	79	53	85	64	78	69	84	70	98	74
York, .....	89	65	90	69	84	71	85	71	80	68	76	51	51	83	53	82	58	90	69	81	72	98	74



Pittsburg, .....	76	61	78	58	78	62	81	61	93	67	85	66	92	73	87	63	80	64	83.0	86.0
Pottstown, .....	81	71	71	65	81	65	85	61	94	68	89	69	90	70	91	69	82	70	85.6	87.1
Quakertown, .....	79	68	70	61	79	61	85	52	92	65	89	66	89	68	91	64	79	68	85.2	86.1
Scranton, .....	74	60	68	53	80	46	80	52	86	62	82	64	89	61	91	63	83	53	82.7	85.5
Selinsgrove, .....	76	66	69	57	77	59	84	51	91	68	86	69	91	65	90	68	84	64	83.6	81.2
Shingle House, .....	80	65	68	59	80	60	84	57	92	68	87	58	84	56	88	60	78	60	84.7	83.8
Smithport, .....	60	54	55	49	70	48	77	48	83	66	83	63	85	60	85	60	75	58	79.7	54.2
Somers, .....	73	53	61	54	76	48	77	50	84	60	83	56	86	64	84	63	76	60	80.2	56.0
South Eaton, .....	74	64	70	54	72	52	77	57	85	60	80	60	80	62	86	60	76	58	78.5	56.9
State College, .....	74	61	63	57	75	58	80	53	88	68	83	67	85	65	88	65	80	65	80.6	61.8
St. Mary's, .....	75	60	70	54	77	58	79	55	89	68	84	65	86	67	85	64	76	65	80.2	61.8
St. Mary's, .....	77	54	59	54	75	53	75	50	86	64	78	65	82	62	82	64	76	60	77.9	58.9
Swarthmore, .....	74	61	75	68	77	57	81	49	88	68	87	66	89	65	89	65	76	62	83.2	60.5
Towanda, .....	74	63	76	63	77	63	83	68	91	68	83	66	91	71	89	65	79	66	81.9	64.0
Uniontown, .....	74	63	76	63	77	63	83	68	91	68	83	66	91	71	89	65	79	66	81.9	64.0
Warren, .....	84	54	74	75	62	52	76	55	77	63	81	68	79	66	87	69	85	61	79.3	58.0
West Chester, .....	80	71	72	68	78	64	82	61	90	67	87	70	90	71	90	69	83	67	83.5	67.3
Westtown, .....	82	68	74	59	81	59	85	54	92	69	86	68	92	65	92	68	86	65	86.0	62.5
Wilkes-Barre, .....	78	58	63	57	78	61	80	57	87	63	83	69	87	68	88	71	76	67	81.5	63.2
Williamsport, .....	80	68	72	61	79	60	85	56	94	67	88	79	91	69	91	68	84	67	84.0	63.2
York, .....	80	68	72	61	79	60	85	56	94	67	88	79	91	69	91	68	84	67	84.0	63.2

## Daily Precipitation for Pennsylvania, July, 1896.

Stations.	Day of Month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
<b>Delaware Basin.</b>																
Bethlehem.				.14	.31	.31	.53	.01	1.05			.03	.04		†	.27
Blooming Grove.		.24		.40			.61	.50	.71				.93		.30	
Browns Lock.					.14		.61	.50	.71							
Coatesville.				†	.06		.06	.46								.08
Coopersburg.				.02	.23		.27	.91					.01		.02	.01
Doylstown.					.08		.41	.48	.05							
Dyberry.																
Easton.				•	.61		.60	2.55					.01	†		.57
Forks of Neshaminy.					.06	.02	.19	.27	.02	.03					.18	.01
Frederick.		1.30		.03	.30	†	.57	1.73							.05	
Hamburg.				1.14			.11	.08	.08							.15
Haminton.					.35	.04	.31	.41	.31					1.24		.08
Honesdale.																
Kennett Square.					.04	.06	.20	.04	1.43	.07						.07
Lansdale.					.10		.25	1.20								
Mauch Chunk.				1.08	†		.17	.02	.61			.02			.03	.45
Ottaville.					.50		.10	1.17							.05	
Philadelphia (a).					.04	.05	.18	.01	.09	.66					†	.04
Philadelphia (b).					.11	.13	.12	.01	.06	.71					.01	.04
Point Pleasant.					.33			.33	.69							
Pottstown.				.47		.40	.10		1.50						†	
Quakertown.				.01	.39	†	.03	†	1.86				.25			
Reading.				.08	.10	.15	.16	.01	.05						.01	.01
Shelbstville.					.38		.13		1.66						.04	
Shawmont.				.15		.22	.06	.01	.34						.01	.04
Smiths Corner.					.02		.28		1.23							
Swarthmore.																.95
West Chester.				.02	.15		.37		1.57							
Westtown.								†					†			.13
White Haven.		.52			.64	†		†	1.45							
<b>Susquehanna Basin.</b>																
Altoona.				.53	.01	.03	.05	.54	.16					.31	.40	.53
Aqueduct.				.45	.26	1.52	.43	.06	.16						.25	
Carlisle.					.18	.10	.18	.06	.67					.07	.06	
Centre Hall.				.60				.86					.16	.45	.45	
Emporium.						.11		.05	.80				†		.13	.06
Girardville.				1.35				.44	3.00			.62			.25	
Grampian.				.36		.06	.08	•	.52				•	.15	.27	.20



## Daily Precipitation for Pennsylvania, July, 1896—Continued.

Stations.	Day of Month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Delaware Basin.																	
Bethlehem.				.78		1.26										6.13	
Blooming Grove.					.34	.74		.35			1.22	.43	.52			5.80	
Browers Lock.						2.83		.73			.41	.07	.05	.04		5.36	
Coatesville.					.04	.66		.13			.49		.06	.26		3.04	
Coopersburg.				.10	.56	1.91		.22			.98					8.46	
Doylestown.					.27	2.10		1.57			.52		.40	1.31		5.34	
Dyberry.								.33			.34		.54	.52		10.28	
Easton.				•	1.44	1.31	1.00	•	.39		1.02	.53		.15		7.74	
Forks of Neshaminy.				.03	.74	1.10	.35	.10			.63		.34	.64		6.00	
Frederick.				.72		1.51	.13	.25			.40	.10	.42			5.08	
Hamburg.				.86		.65		.71			.90					4.44	
Ham'nton.				.06	.47	.14	.09	.32	.63		.04	.85	.09	.30	.04	6.20	
Honesdale.																3.27	
Kennett Square.					†	.56	.06	.29					.07	.62		7.12	
Lansdale.						2.62	.16				.41		.39	.26		6.40	
Mauch Chunk.					.81	.23		.34			1.66	.48	.27			3.20	
Ottaville.				1.00	1.00	2.90	.30	.15			1.06		.47	1.00		9.69	
Philadelphia (a).				.03	.03	.10		.15			.72	.02	†	.45		3.27	
Philadelphia (b).				†		.82	.12	.12			.58	.02		.44		7.13	
Point Pleasant.					1.68	1.47		.35			.82		.66	.87		6.30	
Pottstown.				.60		1.70		.21			.39	.57	.41			8.20	
Quakertown.				.04	.97	1.10	.19	.13	.05		.57	.55		2.01		9.92	
Reading.					.50	3.08	.60	.00			1.07			.20		10.86	
Reisholtzville.				.51	.76	1.32	1.24	.25			.87		.54	1.39		3.26	
Shawmont.					.02	1.32		.10			.76		.04	.20		7.21	
Smiths Corner.					.88	2.02	.14	.13			.80		.28	1.07		3.54	
Swarthmore.																7.60	
West Chester.					.06	.41		.26			.38	.03		.25		5.35	
Westtown.						1.16		.38			2.06	.69	.17	.14		7.90	
White Haven.				.27												5.35	
Susquehanna Basin.																	
Altoona.				.43	.02			.96			.78	.15	.03	.42		4.64	
Aquetuct.				.23	.49	.22		.40			.68	.12	.05	1.79		5.66	
Carlisle.				•				•	1.30		.28	.15		1.00		11.30	
Centre Hall.				.42				.92			.70	.39	1.12			8.83	
Emporium.					.14	.30		1.16			.86	†		.12		7.21	
Grainville.					.06	.08		.53			1.08	.31	1.40			6.13	
Granville.				.46	.70	.14		1.12			.71	.24	.83	.49		6.20	

Harriaburg, .....	.08	.13	1.72	..	.21	..	.43	.07	†	.67	6.32
Holldayshurg, .....	.47	.11	..	..	.94	..	.35	.20	.28	.90	7.10
Huntingdon, .....	.45	.02	..	..	.90	..	.30	.30	.50	..	4.63
Lancaster, .....	..	..	..	..	..	..	..	..	..	..	..
Lebanon, .....	.27	.01	1.27	.33	.20	..	.55	.01	1.21	.02	6.38
Le Roy, .....	.20	.06	.34	..	1.10	.04	.87	1.14	.25	.25	5.84
Lock Haven, .....	.24	..	.38	..	.50	..	.72	..	.63	..	6.63
Lock Haven, .....	.11	.06	1.00	..	.66	..	.61	.07	.70	..	5.75
Scranton, .....	.23	.80	..	..	.63	..	.56	.07	..	..	4.81
Sellingrove, .....	..	..	..	..	.42	.03	.68	..	.58	.92	4.66
South Eaton, .....	.10	.70	.75	..	.64	.03	.27	.11	.36	..	6.36
State College, .....	.54	.21	..	..	.77	..	.60	1.15	..	..	5.56
Towanda, .....	.19	.17	.63	..	.80	.02	.15	.74	.34	1.09	4.57
Wellsville, .....	.15	†	.45	..	.56	..	†	.54	.10	.10	5.67
Wilkes-Barre, .....	.12	.71	..	..	.69	..	1.15	.28	.20	..	6.20
Williamport, .....	..	.22	.38	..	.47	..	.08	..	.59	..	4.16
York, .....	..	.16	.11	..	.31	..	.29	.09	.03	.46	4.00
Ohio Basin.											
Beaver Dam, .....	.38	.30	..	..	1.23	.22	.19	.52	..	1.22	.21
Brookville, .....	.83	1.81	..	..	.68	1.76	.71	.09	..	.84	.90
Cannonsburg, .....	.40	.20	..	..	..	1.10	..	.10	..	2.70	11.07
Cassandria, .....	.60	.08	†	..	..	..	.29	.50	.26	..	6.76
Confluence, .....	..	.83	.71	..	1.50	.53	.43	..	.63	.87	..
Davis Island Dam, .....	..	..	..	..	..	.32	.35	1.15	..	.07	12.11
Du Bois, .....	.17	.60	.09	..	.24	.73	.27	.52	†	.59	.04
Elwood Junction, .....	.33	.28	..	..	.02	.01	.25	.85	..	1.58	.70
Freeport, .....	.12	.36	..	..	.35	.60	.21	1.30	..	1.26	.46
Greensboro, .....	..	1.05	.91	..	1.05	.75	.70	.90	..	.15	.08
Indiana, .....	..	..	..	..	..	1.33	..	..	..	.65	.60
Johnstown, .....	.78	.03	.10	..	1.52	..	.20	.19	.08	.30	.01
Lock No. 4, .....	†	.97	.031	..	1.24	.46	.43	.07	..	.79	.90
Lycippus, .....	..	.77	.031	..	1.39	.51	.46	1.16	..	1.15	.23
Oil City, .....	.61	.35	..	..	.25	.80	.30	.57	.73	.08	12.84
Parkers Landing, .....	.26	.34	..	..	1.78	1.00	.40	.14	.70	..	6.80
Pittsburg, .....	.80	.60	.36	..	.01	.75	.68	.80	..	.12	.10
Ridgway, .....	.20	.06	..	..	.42	.60	..	.65	.67	.83	8.90
Reagerstown, .....	..	1.25	.49	..	..	.72	..	1.10	.10	.40	.33
Shingle House, .....	.45	.30	.87	..	.70	..	.87	†	.90	..	6.14
Smethport, .....	..	.35	.95	..	..	.55	1.12	.80	..	.15	7.19
Somerset, .....	.90	..	.75	..	..	.48	.42	.23	.20	..	10.55
St. Mary's, .....	..	.71	..	..	..	1.10	.80	.03	.50	†	6.36
Uniontown, .....	.80	.47	.71	..	1.73	..	2.92	1.15	†	1.38	15.59
Warren, .....	..	.04	..	..	.34	.36	..	1.27	.54	†	6.58
West Newton, .....	..	1.01	.22	..	.31	..	.30	.10	2.61	.30	1.01
West Newton, .....	..	1.03	.03	..	.18	.28	.70	..	..	..	11.46
Potomac Basin.											
Chambersburg, .....	..	.45	.17	..	..	.66	..	.07	.11	.25	4.09
Lake Basin.											
Erie, .....	..	.06	..	†	†	.26	..	.74	†	..	5.50

\* Precipitation included in that of the following day.

† Trace, when precipitation is less than 0.01 inch.



## CLIMATOLOGY OF THE MONTH.

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General Characteristics.

The mean temperature for August was 1.3° above the normal. Unusually high temperatures occurred from the 5th to the 12th inclusive. At most stations a maximum of over ninety degrees was recorded on each day during this period. An unusual large number of deaths from sunstroke were reported. The last half of the month was comparatively cool. The frosts of the 20th and 28th did but little damage to crops. The rainfall, 2.22 inches, is but little over half the usual amount. The greatest deficiency occurred in the southeastern portion of the State, where there was less than one inch. Owing to the unequal distribution of the rainfall, severe local droughts existed in many sections, which seriously affected the proper development of crops and delayed the seeding of grain.

## Atmospheric Pressure.

The mean pressure for the month, 30.05 inches, is .03 above the normal. At the United States Weather Bureau stations the highest observed was 30.40 inches, at Erie and Pittsburgh on the 28th, and the lowest, 29.74 inches, at Erie on the 1st.

## Temperature.

The mean of the daily maximum and minimum temperatures, 82.3 degrees and 60.1 degrees respectively, give a monthly mean of 71.2 degrees, which is 1.3 degrees above the normal, and 1.1 degrees below the corresponding month of 1895.

The average daily range was 22.2°.

The highest monthly mean was 76.6°, at Philadelphia Weather Bureau.

The lowest monthly mean was 66.2°, at Dyberry and Smethport.

The highest temperature recorded during the month was 101°, on the 9th at Aqueduct, and 11th at Honesdale.

The lowest temperature was 35°, on the 29th at Saegerstown and Dyberry.

The greatest local range was 60°, at Saegerstown and Blooming Grove.

The least local monthly range was 35°, at Brookville.

The greatest daily range was 42°, at Shingle House, Hollidaysburg, and Saegerstown.



107. Doo.

## Precipitation.

The average precipitation for the month, 2.22 inches, is 2.06 inches less than the normal.

The largest totals of rainfall, in inches, were: West Newton, 6.53; Parkers Landing, 5.01; Beaver Dam, 4.64; Lycippus, 4.48; Renovo, 4.12; Pittsburg, 4.09. The least were: Ottsville, 0.45; Philadelphia, Weather Bureau, 0.46; Reading, 0.48; Shingle House, 0.50; Pottstown, 0.55; Lebanon, 0.56.

## Wind and Weather.

The prevailing wind was from the west.

Average number of rainy days, 8; clear, 14; partly cloudy, 11; cloudy, 6.

## Miscellaneous Phenomena.

Thunderstorms.—1, 5, 6, 7, 9, 10, 11, 12, 13, 14, 16, 18, 19, 22, 23, 27, 30.

Hail.—Easton, 16.

Frost.—19, 20, 27, 28, 29, 30.

Aurora.—Blooming Grove, 6; Le Roy, 29.

Lunar Halo.—State College, 18; West Chester, 22.

Meteors.—State College, 5, 6, 11.

## Climatological Data for Pennsylvania, August, 1896.

Country.	Stations.	Elevation, feet.	Length of record, years.	Temperature in degrees, Fahrenheit.					Precipitation, in inches.			Sky.				Prevailing wind direction of				
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in twenty-four hours.	Total snowfall, melted.	Number rainy days.		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Allegheny.	Pittsburg.	842	25	73.0	+1.0	94	6	50	29	28	4.09	+0.87	2.31	.....	12	11	12	8	W	
Berks.	Hamburg.	330	5	74.2	+1.4	99	9	45	19	35	1.93	-2.14	0.78	.....	7	10	16	5	NW	
Berk.	Reading 2.	280	8	73.6	+1.9	.....	.....	.....	.....	.....	0.43	-3.54	0.35	.....	8	.....	.....	.....	.....	
Blair.	Altoona.	1,181	8	69.6	-0.3	94	9	41	20	37	1.88	-1.40	0.59	.....	10	.....	.....	.....	.....	
Bradford.	Hollidaysburg h.	947	8	72.3	+3.1	98	9	40	29	42	1.76	-1.81	1.03	.....	8	18	6	1	W	
Bradford.	Le Roy.	1,400	7	67.2	+1.3	93	6	44	20	30	2.22	-1.65	1.02	.....	10	8	16	14	1	SW
Bucks.	Towanda.	754	7	69.0	.....	91	6	39	20	34	2.97	.....	.....	.....	9	16	14	1	W	
Bucks.	Forks of Neshaminy l.	304	7	74.7	+2.6	.....	.....	.....	.....	.....	0.83	-3.83	0.96	.....	7	12	.....	9	NW	
Cambria.	Quakertown.	536	21	71.4	+1.7	96	6	42	29	38	0.67	-5.23	0.27	.....	5	14	8	9	SW	
Cambria.	Cassandria.	2,100	11	70.8	.....	93	9	43	29	37	3.51	-0.19	0.94	.....	13	10	20	1	NW	
Cameron.	Johnstown.	1,184	11	.....	.....	.....	.....	.....	.....	.....	4.00	.....	2.20	.....	9	.....	.....	.....	.....	
Carbon.	Emporium.	1,070	8	68.2	-0.5	91	9	43	29	31	1.62	-2.21	0.44	.....	5	14	16	1	W	
Carbon.	East Mauch Chunk.	550	6	71.4	+1.8	98	9	41	29	37	2.83	-1.62	0.82	.....	9	18	6	7	S	
Centre.	State College.	1,191	8	69.8	+1.3	93	9	45	28	20	1.56	-2.82	0.45	.....	11	12	8	10	W	
Centre.	Centre Hall.	.....	.....	70.6	.....	91	9	41	29	35	1.26	.....	0.61	.....	5	13	7	12	W	
Chester.	West Chester.	451	40	74.2	+2.5	95	9	52	20	23	0.95	-4.01	0.20	.....	7	22	5	4	W	
Chester.	Chester.	380	8	73.9	+2.4	96	6	45	20	37	0.63	-2.96	0.21	.....	5	25	4	2	S	
Chester.	Kennett Square.	275	6	73.6	+2.5	97	9	46	20	36	0.91	-3.88	0.47	.....	6	16	11	4	N	
Chester.	Westtown.	350	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Chester.	Grampian.	1,450	31	69.7	+2.0	92	9	42	20	30	3.98	-0.97	1.64	.....	12	11	14	6	SW	
Chester.	Lock Haven l.	560	8	72.4	+1.3	97	9	46	20	39	3.96	-0.48	1.32	.....	8	13	6	3	W	
Chester.	Renova.	.....	.....	70.4	.....	93	9	41	20	33	4.12	.....	1.56	.....	7	18	9	4	SW	
Crawford.	Shagersstown.	1,200	4	61.4	-0.4	91	9	36	21	42	3.59	-0.95	1.80	.....	7	6	14	11	NW	
Cumberland.	Carlisle b.	480	8	73.7	+1.7	101	6	41	29	40	0.74	-3.91	0.34	.....	3	20	6	3	S	
Dauphin.	Harrisburg.	361	9	73.7	+0.7	95	7	50	20	29	1.45	-3.41	0.41	.....	11	13	9	9	W	
Delaware.	Swarthmore.	190	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Delaware.	St. Mary.	.....	.....	67.0	.....	91	6	0	20	37	2.98	.....	1.28	.....	6	11	11	9	SW	
Erie.	Edinboro <sup>1</sup> .	1,220	7	67.1	+1.0	90	8	42	29	.....	.....	.....	.....	.....	17	6	8	2	SW	
Erie.	Erie.	1,400	21	69.5	-0.2	92	6	49	20	21	3.47	+0.13	1.36	.....	13	9	20	2	SW	
Franklin.	Franklin.	681	8	71.2	-0.1	92	9	41	29	29	2.82	-3.03	1.15	.....	7	23	6	2	NW	
Franklin.	Uniontown.	1,000	4	71.4	-0.2	95	6	42	29	40	0.99	-3.55	0.57	.....	5	9	10	13	W	

Greene.	Greenboro.	7	73.0	.....	98	9	48	20	37	1.93	-1.60	0.50	.....	9	4	22	5	SW	
Huntingdon.	Huntingdon.	651	71.0	+0.4	90	9	43	50	29	2.45	-1.14	0.32	.....	9	21	4	12	SW	
Indiana.	Indiana.	1.30	68.8	+0.1	91	14	50	27	24	3.53	+1.17	1.04	.....	10	18	2	10	W	
Jefferson.	Brookville.	741	70.2	.....	95	9	41	29	37	2.60	.....	0.35	.....	7	18	8	5	W	
Lackawanna.	Scranton.	413	71.0	.....	90	6	46	19	31	.....	.....	.....	.....	.....	.....	.....	.....	W	
Lancaster.	Lancaster J.	413	71.0	+2.0	96	6	43	20	36	0.50	-3.96	0.34	.....	8	12	12	6	SW	
Lebanon.	Lebanon.	730	73.0	+2.0	93	9	48	20	38	0.66	-4.32	0.11	.....	8	22	7	2	NW	
Lelah.	Coopersburg.	6	68.3	.....	89	6	47	20	26	.....	.....	.....	.....	8	18	6	7	W	
Laserne.	Wilton.	1.250	71.9	.....	100	6	50	29	.....	2.44	.....	0.07	.....	9	10	21	0	N	
Laserne.	Wilton Haven.	1.575	71.0	+0.7	97	6	43	29	35	2.99	-1.06	0.79	.....	11	16	13	2	W	
Laserne.	Wilton-Bary.	650	70.4	+1.0	93	6	45	29	32	2.90	-2.06	0.85	.....	7	20	8	3	W	
Laserne.	Williamsport.	1.500	66.2	+0.7	91	6	31	29	37	2.27	-2.23	0.65	.....	7	10	9	6	W	
McKean.	Snethport.	1.70	74.0	+1.2	98	6	48	29	30	0.55	-4.00	0.22	.....	4	23	3	5	W	
Northampton.	South Bethlehem.	339	77.3	.....	98	9	56	29	.....	2.2	-1.77	0.84	.....	9	17	13	1	W	
Northampton.	Easton.	337	72.5	+0.5	96	7	48	29	36	3.47	-1.04	0.96	.....	9	29	6	3	W	
Philadelphia.	Aqueduct.	367	74.2	+2.1	101	9	44	29	37	2.00	-2.12	0.70	.....	11	14	9	8	W	
Philadelphia.	Philadelphia.	117	75.0	+2.6	97	11	56	29	20	25	0.43	-3.89	0.30	.....	6	14	9	8	SW
Philadelphia.	1529 Centennial avenue.	120	76.2	+1.3	98	11	51	29	25	0.85	-2.21	0.29	.....	6	16	10	5	SW	
Pike.	Blooming Grove.	1.428	69.3	+1.1	99	9	39	29	32	2.71	-2.54	0.76	.....	9	5	17	9	NW	
Potter.	Shingle House.	1.475	60.3	.....	93	6	40	27	42	0.50	.....	0.50	.....	1	5	22	4	W	
Snyder.	Sellinghouse.	1.465	71.8	+0.1	98	6	41	27	37	2.18	-3.21	0.83	.....	5	0	21	10	SW	
Somerset.	Somerset.	2.350	67.8	+1.0	94	12	38	21	34	1.71	-2.43	0.75	.....	4	15	14	2	SW	
Somerset.	Confluence.	1.327	76.8	.....	91	7	44	20	35	2.47	-1.04	0.99	.....	11	0	18	13	NW	
Tioga.	Wellabors.	1.450	71.2	+2.1	95	9	40	29	40	1.79	-3.77	0.60	.....	4	17	9	5	N	
Union.	Warren.	.....	67.2	.....	90	7	41	50	38	2.99	-1.49	1.67	.....	7	10	18	3	S	
Warren.	Cannonsburg.	936	72.6	+2.6	99	9	48	29	39	1.76	-1.75	0.40	.....	8	17	5	9	S	
Washington.	Dyberry.	1.100	70.6	+1.3	91	9	35	29	40	1.40	-2.51	1.60	.....	4	10	14	1	W	
Wayne.	Honesdale.	1,000	71.6	+5.5	101	11	43	19	38	1.68	-2.44	0.38	.....	2	18	10	3	W	
Wayne.	Hamilton.	1,600	70.6	+3.4	96	9	44	31	32	3.82	-0.70	0.94	.....	6	18	4	9	NW	
Wayne.	Lycippus.	1,428	71.2	+0.5	90	7	50	29	27	4.08	+2.51	1.55	.....	13	6	14	11	NW	
Westmoreland	South Eaton.	1,660	68.5	-0.3	91	9	39	19	28	3.68	-2.84	1.42	.....	10	7	18	10	3	SW
Wyoming	York.	345	73.2	+1.0	97	12	43	29	37	1.65	-2.57	0.64	.....	9	19	10	3	SW	
York.	York.	345	73.2	+1.0	97	12	43	29	37	1.65	-2.57	0.64	.....	9	19	10	3	SW	

\*Extremes of temperature from observed readings of dry thermometers.

1 Mean of 7 A. M. to 2 P. M. + 9 P. M. + 9 P. M. + 4.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

A roman letter following the name of a station, or placed against the data in the body of the form, indicates the number of days missing from the record; for instance, "n" denotes 14 days missing.

Maximum and Minimum Temperatures for Pennsylvania, August, 1896.

Stations.	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	74	55	83	64	84	60	87	58	92	65	93	65	90	66	89	70	94	73	87	69
Aqueduct.	83	67	87	67	90	69	92	71	96	72	99	70	99	69	98	67	101	70	97	67
Bloomington.	76	50	75	56	81	60	82	64	94	74	98	76	87	68	94	70	99	74	96	65
Brookville.	88	69	90	74	87	71	83	77	83	72	87	73	89	68	90	74	83	74	81	72
Cannonsburg.	79	63	82	70	81	64	85	63	89	70	89	73	88	75	85	75	89	75	87	75
Carlisle.	78	54	88	65	81	63	93	65	97	66	100	69	98	72	96	73	93	75	90	74
Cassandria.	78	60	81	62	82	64	80	68	85	62	92	72	91	70	89	84	93	75	90	74
Centre Hall.	74	52	79	63	84	60	88	59	93	65	93	66	88	69	83	68	93	72	88	68
Chambersburg.	76	52	85	66	87	61	90	61	93	62	96	64	93	69	91	68	94	68	90	63
Coatesville.	78	52	87	70	87	58	91	65	94	61	99	71	97	73	96	73	97	72	92	72
Confluence.	70	51	80	51	81	62	84	64	87	64	92	62	94	64	92	70	86	71	94	59
Coopersburg.	76	55	82	67	83	62	86	68	90	70	93	73	92	75	91	74	91	76	90	71
Drifton.	78	56	76	60	78	52	82	62	87	61	89	71	88	73	85	63	88	76	82	70
Dyberry.	75	45	77	60	82	50	87	49	92	60	93	65	91	67	90	61	95	56	91	67
Easton.	77	53	80	65	86	59	87	61	90	68	93	69	96	88	90	70	93	85	86	63
Emporium.	75	62	77	61	81	56	86	69	90	61	90	66	88	72	88	70	92	76	88	67
Erie.	74	61	74	64	76	60	86	67	86	72	92	73	93	83	88	72	96	76	88	67
Grampian.	76	58	80	67	82	64	86	60	90	64	92	66	93	80	89	68	90	70	86	63
Greensburg.	70	52	85	67	89	63	91	61	94	67	97	67	97	84	88	74	90	80	69	63
Hamburg.	75	63	86	67	89	65	93	67	98	70	94	71	90	74	93	66	96	71	84	73
Hamilton.	76	67	84	68	85	65	88	69	92	70	94	73	95	70	91	69	94	74	82	73
Hollidaysburg.	82	62	85	65	88	60	90	58	96	61	97	63	93	65	93	68	98	73	91	69
Hollidaysburg.	71	64	78	62	83	54	74	58	84	61	86	69	84	70	82	67	97	66	90	70
Honesdale.	73	51	85	63	86	60	82	63	84	61	86	65	94	65	92	67	96	68	90	69
Huntingdon.	78	58	80	65	76	63	82	66	85	66	89	67	90	70	88	80	90	70	83	68
Indiana.	80	53	88	53	87	58	90	64	95	68	97	70	96	73	91	72	97	72	92	72
Johnstown.	83	52	90	67	86	59	96	69	98	68	99	68	96	71	95	72	95	72	94	67
Kennett Square.	75	51	86	66	86	59	90	66	98	68	98	69	91	71	87	67	93	72	92	70
Lebanon.	76	52	84	60	79	59	89	61	93	65	93	68	93	68	91	68	95	72	90	70
Le Roy.	78	56	82	70	83	63	94	69	93	71	97	74	93	66	94	66	97	67	90	63
Lewisburg.	77	64	80	67	80	63	82	62	86	71	88	71	90	70	88	71	86	72	89	63
Lock Haven.	79	48	83	65	87	45	83	66	95	61	97	66	96	68	93	70	98	68	96	70
Mauch Chunk.	81	64	86	70	88	66	94	71	96	75	95	74	96	75	95	74	96	75	93	75
Philadelphia (a).	81	61	88	68	89	64	91	69	95	71	97	76	97	75	94	76	97	77	82	75
Philadelphia (b).	82	62	81	69	85	65	86	62	92	72	94	75	88	73	83	74	93	79	90	75
Pittsburg.	83	62	81	69	85	65	86	62	92	72	94	75	88	73	83	74	93	79	90	75

Pottstown.	80	60	83	70	87	61	90	63	94	63	96	72	97	77	94	76	97	75	92	72
Quakertown.	70	49	84	63	86	55	89	63	83	64	86	47	96	68	91	83	70	75	92	67
Renovo.	78	54	81	63	83	59	87	60	91	69	83	47	96	68	91	83	70	75	92	67
Reesestown.	74	48	72	63	80	50	87	51	92	60	84	62	96	63	90	80	60	73	85	64
Scranton.	77	49	73	63	85	55	89	59	93	65	86	65	93	65	94	68	91	69	81	70
Selinsgrove.	79	52	76	67	86	58	90	60	96	80	96	66	97	67	91	65	95	67	94	70
Shingle House.	80	45	85	52	82	50	86	35	93	54	83	61	84	62	90	65	90	65	86	65
Smithport.	73	48	76	63	82	54	84	52	91	60	91	61	88	62	89	64	89	69	88	65
Somers.	72	52	76	60	83	62	84	52	92	62	91	60	86	60	88	62	91	72	88	64
South Eaton.	75	50	77	63	80	53	86	60	90	65	91	63	88	69	86	70	91	72	88	68
State College.	71	55	79	64	84	59	85	60	89	61	91	69	86	68	86	69	93	73	85	63
St. Marys.	72	49	77	55	82	51	85	51	90	63	90	65	85	64	90	66	89	71	84	65
Swarthmore.																				
Towanda.	75	53	78	63	84	56	89	55	93	61	94	66	91	68	90	68	93	71	90	68
Uniontown.	86	63	80	67	82	62	85	61	90	66	91	70	90	71	90	72	92	73	89	69
Warren.	76	51	76	59	76	56	80	55	85	63	90	65	90	64	87	66	87	71	89	61
West Chester.	76	53	84	68	85	63	88	67	93	70	95	78	94	76	91	73	95	76	91	73
Westtown.																				
Wilkes-Barre.	80	50	83	52	82	57	91	62	96	66	97	67	96	73	93	70	96	72	93	69
Williamsport.	73	54	70	61	82	63	87	63	92	60	93	69	90	70	89	71	92	70	85	70
York.	78	51	86	61	86	61	90	64	95	67	97	79	96	74	93	71	96	74	94	71



*Maximum and Minimum Temperatures for Pennsylvania, August, 1896.—Continued.*

Stations.	11.		12.		13.		14.		15.		16.		17.		18.		19.		20.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	89	68	91	71	75	65	85	63	57	51	83	67	74	65	73	47	71	51	76	41
Aqueduct.	97	75	96	66	84	67	83	68	84	63	87	61	77	60	69	57	71	54	76	46
Bloomington.	92	70	98	69	84	67	89	60	93	64	74	64	69	63	68	52	67	51	70	42
Brookville.	86	73	88	69	80	74	91	76	90	72	88	78	88	73	75	68	72	56	81	62
Cannonsburg.	87	72	87	72	80	69	83	65	89	64	81	76	77	60	73	54	73	55	76	53
Carlisle.	96	71	97	69	89	69	89	69	90	61	86	71	81	62	82	51	75	55	80	44
Cassandria.	87	76	91	72	79	67	83	64	85	63	87	64	74	67	67	50	66	50	72	44
Centre Hall.	92	69	91	69	75	66	86	63	87	54	82	65	79	57	71	50	69	52	73	43
Chambersburg.	93	67	94	64	85	65	86	67	88	60	87	65	78	61	82	45	74	50	73	45
Coatesville.	97	74	97	71	93	71	87	72	89	66	88	66	82	61	82	50	75	45	78	41
Coopersburg.	91	76	88	66	92	68	77	69	86	60	89	61	87	60	78	52	76	54	75	48
Drifton.	83	69	86	69	77	67	78	61	80	68	78	65	67	56	65	49	62	52	69	47
Dyberry.	92	65	92	60	85	53	80	63	81	41	70	45	80	50	80	45	70	47	73	39
Easton.	91	74	94	71	90	70	83	70	87	72	84	70	73	60	74	56	71	52	63	62
Emporium.	87	66	89	64	78	65	84	61	86	58	82	60	72	47	70	50	69	46	71	45
Erie.	86	68	79	66	72	67	76	63	85	67	77	68	69	60	68	56	64	56	69	49
Grampian.	92	68	88	68	78	66	84	66	92	61	76	61	69	77	60	50	68	48	70	42
Greensburg.	91	68	94	69	86	69	86	69	92	64	86	69	73	61	79	50	75	52	85	48
Hamburg.	74	73	98	69	90	70	86	69	88	67	84	67	69	77	60	77	50	72	64	45
Hamilton.	94	73	94	72	83	66	84	68	87	62	83	66	72	62	73	52	73	49	79	45
Harrisburg.	92	73	94	72	83	73	84	68	86	67	83	66	77	67	75	56	71	59	75	50
Holidaysburg.	84	72	86	67	78	67	87	65	89	62	86	67	73	63	70	46	76	43	72	36
Honesdale.	102	72	100	64	92	66	86	61	89	62	87	60	78	60	75	50	73	46	73	34
Huntingdon.	82	67	83	64	78	66	86	61	87	62	87	60	78	60	75	50	73	46	73	34
Indiana.	86	68	86	69	84	68	86	61	87	62	87	60	78	60	75	50	73	46	73	34
Johnstown.	96	70	96	72	93	71	84	70	88	67	87	65	80	58	82	51	78	51	78	46
Kennett Square.	95	72	96	67	91	63	90	70	90	64	86	67	82	63	78	49	78	50	76	47
Lebanon.	90	70	83	67	77	67	79	60	83	60	82	68	69	50	70	50	64	48	74	44
Lebanon.	91	70	91	65	80	68	87	64	90	59	83	57	79	54	74	52	73	49	75	41
Lebanon.	91	70	91	65	80	68	87	64	90	59	83	57	79	54	74	52	73	49	75	41
Lock Haven.	88	67	85	73	83	67	78	65	88	63	86	71	81	68	71	52	74	50	79	46
Louisburg.	95	69	95	65	87	65	87	65	89	61	83	67	83	67	78	48	73	46	77	41
Mauch Chunk.	97	77	97	77	94	76	82	72	87	71	83	67	78	78	81	62	74	58	75	56
Philadelphia (a).	98	76	96	75	93	75	81	73	85	72	88	67	80	68	82	58	75	57	76	53
Philadelphia (b).	98	76	96	75	93	75	81	73	85	72	88	67	80	68	82	58	75	57	76	53



## Maximum and Minimum Temperatures for Pennsylvania, August, 1896.—Continued.

Stations.	21.		22.		23.		24.		25.		26.		27.		28.		29.		30.		31.		Monthly Mean.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona, .....	70	50	73	50	84	50	78	64	80	53	81	55	74	55	75	46	77	45	81	44	73	58	81.4	57.8
Aquetuct, .....	83	54	83	52	86	52	83	63	86	52	88	57	78	57	78	45	71	39	74	44	73	47	86.8	61.7
Blooming Grove, .....	72	61	83	58	78	63	76	60	77	59	73	59	70	60	72	40	71	39	74	40	68	50	80.1	58.5
Brookville, .....	75	61	85	66	82	64	80	64	80	60	82	62	78	60	81	64	85	61	74	64	75	60	83.5	67.8
Carlonsburg, .....	73	51	80	55	82	57	79	66	80	56	83	59	78	60	81	54	77	48	85	51	73	60	81.2	64.1
Casaca, .....	80	57	77	64	89	69	77	66	85	58	87	59	83	59	83	51	81	44	85	47	78	64	86.3	61.1
Centerville, .....	71	54	78	60	81	70	78	66	79	55	83	60	75	56	75	46	73	43	81	46	77	57	81.6	61.4
Centre Hall, .....	73	54	78	60	81	70	78	66	79	55	83	60	75	56	75	46	73	43	81	46	77	57	81.6	61.4
Chambersburg, .....	76	60	76	60	80	67	78	63	82	54	84	52	82	57	82	42	78	42	83	46	84	61	86.4	61.4
Coatesville, .....	81	52	75	64	87	68	75	62	85	57	85	59	81	60	78	46	80	45	83	46	84	61	86.4	61.4
Confluence, .....	84	54	78	61	78	63	84	62	76	48	81	55	84	59	76	49	75	45	80	49	80	47	83.2	63.7
Coopersburg, .....	76	51	73	58	83	69	72	67	80	60	80	54	79	64	77	51	76	50	79	51	72	58	82.3	63.7
Defion, .....	65	45	71	53	79	68	75	62	79	44	80	40	76	62	82	50	68	40	75	40	78	51	81.1	51.2
Derry, .....	72	55	78	55	75	60	71	59	77	51	80	52	71	50	60	46	74	43	79	48	71	52	79.2	57.2
Easton, .....	72	55	78	55	75	60	71	59	77	51	80	52	71	50	60	46	74	43	79	48	71	52	79.2	57.2
Emporium, .....	71	60	77	62	74	70	72	60	73	55	81	61	69	52	64	57	70	55	78	53	68	54	79.9	59.5
Erie, .....	72	56	72	53	78	70	80	64	84	54	82	58	80	54	76	50	74	44	82	48	68	54	79.9	59.5
Grampian, .....	80	50	82	65	85	48	78	68	86	55	86	53	75	63	78	51	80	45	84	57	75	63	85.7	62.0
Greensboro, .....	79	57	75	63	88	68	75	68	86	58	84	62	78	63	78	51	80	45	84	57	75	63	85.7	62.0
Hamburg, .....	73	51	73	57	76	66	75	62	77	52	78	54	70	57	71	49	76	44	79	54	68	59	80.3	60.5
Harrisburg, .....	73	51	73	57	76	66	75	62	77	52	78	54	70	57	71	49	76	44	79	54	68	59	80.3	60.5
Holldayburg, .....	77	58	75	64	84	69	75	63	82	62	82	60	74	65	76	55	78	40	80	61	73	59	82.3	64.5
Honesdale, .....	80	60	76	66	85	61	85	51	86	48	85	56	80	48	80	41	82	44	85	53	77	46	86.3	57.9
Huntingdon, .....	75	50	75	50	88	61	81	69	84	54	84	54	78	58	77	43	79	44	85	45	75	53	84.1	57.9
Indiana, .....	74	56	73	58	80	55	78	62	80	54	71	47	71	45	71	47	71	45	71	45	71	53	79.3	59.9
Johnstown, .....	82	60	77	64	85	69	76	62	84	58	85	62	80	60	79	50	80	47	80	47	83	64	85.9	61.4
Kennett Square, .....	78	60	81	64	82	68	81	67	81	59	82	68	80	64	78	66	82	64	84	66	81	81	80.4	61.7
Lancaster, .....	78	56	75	64	87	69	77	65	84	55	84	57	81	61	79	46	80	44	81	47	76	82	85.4	60.8
Lebanon, .....	72	56	78	54	80	66	76	60	80	61	83	60	78	61	76	48	72	46	73	50	71	84	78.4	58.9
Le Roy, .....	77	54	79	59	85	70	80	65	84	53	84	50	78	60	77	46	78	40	82	43	76	84	84.0	58.4
Lewistown, .....	78	56	83	68	85	71	83	63	85	55	87	54	80	60	77	46	78	40	82	43	76	84	84.0	58.4
Lock Haven, .....	78	56	83	68	85	71	83	63	85	55	87	54	80	60	77	46	78	40	82	43	76	84	84.0	58.4
Lyons, .....	77	53	76	66	76	61	76	61	76	56	79	64	81	64	70	50	69	50	73	55	73	69	73.9	62.6
Lyonsburg, .....	76	48	73	59	85	68	76	61	76	56	79	64	81	64	70	50	69	50	73	55	73	69	73.9	62.6
Marion, .....	79	62	77	65	83	63	77	68	85	64	87	62	80	67	78	43	78	43	78	43	78	82	80.3	67.6
Philadelphia (a), .....	73	61	79	63	86	67	77	68	85	63	81	60	81	66	73	59	77	57	80	56	85	90	83.6	67.6
Philadelphia (b), .....	73	61	79	63	86	67	77	68	85	63	81	60	81	66	73	59	77	57	80	56	85	90	83.6	67.6



## Daily Precipitation for Pennsylvania, August, 1896

Stations.	Day of Month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
<b>Delaware Basin.</b>																
Bethlehem.		.27					†		.06					.25		.91
Brooming Grove.		.18							†					.35		.64
Browers' Lock.										.00				.32		
Castroville.		.06					.27			.03						
Coopersburg.								.01		.01		†		.22		.07
Doyletown.														.95		
Dyersburg.		.40										1.00				
Easton.		.51					.03							.61		.86
Easton, & Neshaunim.		.02					.05							.78		.05
Frederick.										.07				.31		
Hamberg.												.78		.43		.10
Hamilton.		.94						.04		.02		.32		.38		.04
Honesdale.		.01								.15				.47		.21
Kennett Square.								.01				†		.71		.20
Leansdale.										.06				.20		
Mauch Chunk.		.40					.01							.01		
Ottaville.							.02	†						.21		
Philadelphia (a).		.03					.06	†		†				2.33		.54
Philadelphia (b).		.06														.22
Point Pleasant.														.07		†
Pottstown.									.15					.01		.93
Quakertown.		†					†			.04				.52		.18
Reading.										.35				1.84		
Selsholtzville.										1.53				.12		
Shawmont.		.12					.15							.12		
Smith's Corner.																
Swarthmore.							.20			.06						
West Chester.		.01														
Westtown.													†			
White Haven.		.67					.31			.52						.42
<b>Surquehanna Basin.</b>																
Altoona.	.10	.62					.02			.08			.33			†
Aqueduct.	.23						.70		.03			.03	.02	.16		.45
Carlisle.							.34					.03	.07			
Centre Hall.	.61								.11				.22			
Chaportown.	†	.44							.31			†				
Grantville.	.21	.20										.02	.02	.42		
Grampian.	.21	1.64					.13		.15	.50		.12	.13	.08		.01
Harrisburg.		†					.25			.09		.41	.08			.41

Ohio Basin.									
Hollidaysburg.	.15	.60	.04	.50	.10	.21	.50	.04	.50
Huntingdon.			.02		.04		.22		.22
Lancaster.									
Lebanon.			.07	†	.03		†	.01	†
Le Roy.	.04	.30	1.02		.21	.16	†	.06	.20
Lewisburg.	.60			.23		.31	.06	.01	
Lock Haven.	1.01		.18	.51		1.32			
Renovo.	1.15			.70			.05		
Seranton.	.70		.09			1.51	.95		.26
Sellinsgrove.	.34								
South Eaton.			1.42	†	0	.93		.48	†
State College.			.07	.02	†	.45	.13	.01	.24
Towanda.	†	.17	.61	.96				.01	.66
Wellsville.				.36					
Wilkes-Barre.	.79		.18	.04		.50	.04	.31	.44
Williamsport.	.95		.13	.13			.53		.63
York.	.03		.10		.10	.61	.02	†	.02
Ohio Basin.									
Beaver Dam.	.07		.01	.05	2.76	.79		.10	.37
Brookville.	1.04		.03		.51		.74		.74
Cannonsburg.				†	15	.20	.40		.40
Cassandria.	.02	.13	.13	.10	29	.02	.94		.94
Confidence.				.99	.01			.09	
Davis Island Dam.	.07	.02	.40	.01	†	.11		1.41	
Du Bois.	.42		.01	.06	.33	.60	†	.05	
Elwood Junction.	2.04		.01		.93	.70	.88		
Freeport.	.08		.43		.96	.15	.05	.60	
Greensboro.	†	.15	†		.10	.15	.11		
Indiana.									
Johnstown.				.22	.40		.02	2.20	
Lock No. 4.	†			.37	.60	.04	.70	.25	.01
Lycippus.		.02	.27	1.55	.50	.04	.72	.40	.05
Oil City.					.68	.70			
Parkers' Landing.	1.58				.70	.40		.08	
Rittsburg.	.10		.42	.05	.01	.06	.02	2.31	†
Ridgway.			.11		.64	.30	.30	.09	
Riverside.			.21	.35	1.81	.35			
Sassaraw.									
Shuttle House.			†						†
Summit.	.15		.05	1.00	.20				
St. Mary.			.36						
Uniontown.	†	.35		1.28	.32	.30	.31		
Warren.			.01		1.67	.05	.01		.02
West Newton.	.49	†	†	2.86	1.17	.12	.62	.22	
Potomac Basin.									
Chambersburg.		.02	.27					.57	.07
Lake Basin.									
Erle.		.32	.18	.02	.02	.03	1.35	.09	.21

† Trace, when precipitation is less than 0.01 inch.

\* Precipitation included in that of the following day.







## CLIMATOLOGY OF THE MONTH.

## General Characteristics.

The month of September was a notable one, being characterized by both high and low temperatures and destructive storms.

One of the most severe hail storms since that of 1871 swept over the eastern portion of the State on the afternoon of the 17th, from Lycoming county in a southeasterly course over portions of Columbia, Montour, Northumberland, Schuylkill, Lehigh, Berks, Bucks, Montgomery, Chester, and Delaware counties. Several buildings were struck by lightning and burned, and the damage by wind and hail to buildings, window glass, trees, grape vines, orchards, garden truck, poultry, etc., amounted to many thousands of dollars. Many of the hailstones were reported as large as hens' eggs, and there were wagon loads the size of walnuts.

The interior portion of the State was visited by the tropical cyclone of the 29th and 30th. The newspapers estimate the resulting damages at about two millions of dollars. The Pennsylvania Railroad bridge, over a mile in length, across the Susquehanna river at Columbia, was completely demolished and swept from its piers. A conservative estimate of the damages in York county places them at \$300,000.

The first killing frost was generally reported on the morning of the 24th.

## Atmospheric Pressure.

The mean pressure for the month, 30.05 inches, is .03 below the normal. At the United States Weather Bureau stations the highest observed was 30.37 inches, at Erie on the 23d and Pittsburg on the 24th, and the lowest, 29.47 inches, at Erie on the 29th.

## Temperature.

The means of the daily maximum and minimum temperatures, 75° and 52.3° respectively, give a monthly mean of 63.6°, which is 0.1° below the normal, and 4.2° below the corresponding month of 1895.

The average daily range was 22.7°.

The highest monthly mean was 71.6°, at Irwin.

The lowest monthly mean was 58.6°, at Smethport.

The highest temperature recorded during the month was 99° on the 11th at Honesdale, and 12th at Irwin.

No. 19.1

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The lowest temperature was  $26^{\circ}$ , on the 23d at Shingle House.

The greatest local monthly range was  $64^{\circ}$ , at Shingle House.

The least local monthly range was  $43^{\circ}$ , at Brookville.

The greatest daily range was  $54^{\circ}$ , at Saegerstown.

#### Precipitation.

The average precipitation for the month, 4.82 inches, is 1.04 inches more than the normal.

The largest totals in rainfall, in inches, were: Browsers Lock, 8.57; Forks of Neshaminy, 8.49; Coatesville, 8.31; Quakertown, 7.11; Westtown, 6.97; Ottsville, 6.95. The least were: Cannonsburg, 1.73; Harrisburg, 1.81; Wilkesbarre, 2.26; Scranton, 2.33; South Eaton, 2.45; Chambersburg, 2.52.

#### Wind and Weather.

The prevailing wind was from the west.

Average number of rainy days, 10; clear, 13; partly cloudy, 8; cloudy, 9.

#### Miscellaneous Phenomena.

Thunderstorms.—3, 5, 6, 11, 12, 14, 15, 16, 17, 18, 19, 22, 29.

Hail.—White Haven 12; Quakertown West Chester, Westtown, Coopersburg, and Williamsport, 17th.

Frost.—1, 2, 4, 5, 7, 8, 20, 21, 22, 23, 24, 25, 30.

Coronae.—Cassandria, 13th.







*Maximum and Minimum Temperatures for Pennsylvania, September, 1896.*

Stations.	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona, .....	71	49	90	48	83	53	73	46	61	46	69	56	70	43	76	43	81	43	88	53
Aqueduct, .....	72	51	85	37	93	52	75	53	61	54	71	56	68	46	77	51	82	45	89	54
Bloomington, .....	77	52	78	37	90	59	60	40	68	55	71	58	73	44	77	43	72	43	84	54
Brookville, .....	73	50	82	50	79	60	74	50	72	55	69	58	68	55	76	53	81	49	86	59
Cannonsburg, .....	78	56	83	50	83	61	75	41	73	63	71	63	68	51	79	49	83	53	90	63
Carlisle, .....	76	46	80	45	86	58	76	50	62	60	66	45	78	48	80	47	86	48	93	52
Casandria, .....	68	40	80	56	79	62	70	47	62	60	66	56	69	43	70	42	78	45	86	56
Center Hall, .....	72	44	77	43	83	53	74	47	70	50	70	54	70	49	74	45	77	45	87	53
Chambersburg, .....	74	40	79	44	92	53	76	44	61	46	76	53	76	44	76	46	82	43	91	50
Coatesville, .....	75	48	78	42	91	57	74	50	86	54	71	42	71	44	76	46	76	46	89	54
Confluence, .....	81	46	82	49	83	55	74	50	86	54	71	42	71	44	76	46	76	46	89	54
Coopersburg, .....	73	49	76	45	88	61	74	54	68	46	67	43	76	54	73	43	82	43	90	54
Drifton, .....	62	43	78	46	81	46	68	40	61	58	64	46	66	44	71	41	72	40	82	46
Dyberry, .....	65	35	72	32	81	56	68	40	61	58	64	46	66	44	71	41	72	40	82	46
Easton, .....	69	49	74	43	86	61	79	53	69	47	63	40	68	44	71	41	72	40	82	46
Emporium, .....	67	40	78	39	78	54	67	46	60	43	67	54	63	51	72	46	77	46	86	54
Erie, .....	63	51	74	51	76	61	61	51	64	53	62	54	74	44	76	44	73	43	81	57
Grampian, .....	96	44	76	42	84	56	72	43	60	58	72	54	78	46	83	43	83	43	90	58
Greensboro, .....	75	47	80	50	84	60	74	47	74	60	76	59	78	49	78	49	78	49	86	58
Hamburg, .....	74	50	80	43	91	56	75	53	66	49	71	59	74	43	78	43	80	43	89	53
Harrisburg, .....	68	44	74	41	77	59	60	46	60	41	71	59	74	43	78	43	80	43	89	53
Hollidaysburg, .....	71	53	76	40	89	63	75	42	66	51	74	54	73	44	78	44	83	43	92	54
Honesdale, .....	75	38	83	40	88	63	76	40	64	50	76	54	73	44	78	44	83	43	90	54
Honedale, .....	74	38	78	36	86	60	76	40	64	50	76	54	73	44	78	44	83	43	90	54
Huntingdon, .....	74	40	83	42	90	64	75	45	61	41	73	55	63	41	77	43	83	44	92	50
Indiana, .....	72	56	80	50	73	60	73	60	73	60	73	60	73	60	73	60	73	60	97	57
Irwin, .....	71	56	86	71	83	67	67	67	73	67	76	63	75	66	84	61	84	70	92	80
Johnstown, .....	71	56	86	71	83	67	67	67	73	67	76	63	75	66	84	61	84	70	92	80
Kennett Square, .....	74	54	77	42	80	61	76	54	70	45	75	55	73	54	78	54	83	54	89	61
Lancaster, .....	79	53	80	53	81	60	80	62	78	58	75	60	73	63	81	60	84	63	92	63
Lebanon, .....	75	44	77	42	91	56	78	50	78	49	75	60	77	46	79	46	83	47	91	54
Le Roy, .....	64	43	72	42	74	52	70	44	65	41	70	54	70	46	75	47	74	48	85	53
Lewisburg, .....	74	40	78	38	88	60	75	45	61	40	74	53	75	43	78	45	83	45	91	46
Lock Haven, .....	75	43	80	43	83	44	75	45	70	47	75	56	74	46	81	49	84	48	91	43
Lycippus, .....	72	47	76	38	86	56	74	53	63	40	70	57	75	46	78	44	80	45	89	60
Mauch Chunk, .....	72	47	76	38	86	56	74	53	63	40	70	57	75	46	78	44	80	45	89	60
Philadelphia, (a) .....	72	56	77	56	89	62	74	53	70	53	77	64	78	53	74	60	80	53	86	67

Philadelphia, (b) .....	73	53	71	32	83	90	73	57	71	53	78	67	77	56	75	58	80	57	86	53
Philadelphia, .....	69	49	53	51	80	90	40	73	57	71	58	61	60	52	77	51	81	54	87	53
Pottsville, .....	73	50	52	52	80	90	40	72	53	71	58	61	60	52	77	51	81	54	87	53
Pottsville, .....	72	48	50	50	79	88	39	72	48	68	41	77	48	76	72	48	80	50	86	53
Quakertown, .....	69	47	48	48	76	85	37	46	61	39	65	50	71	43	77	41	82	40	88	50
Scranton, .....	69	47	48	48	76	85	37	46	61	39	65	50	71	43	77	41	82	40	88	50
Scranton, .....	71	46	74	38	86	90	73	58	68	42	72	50	73	48	77	42	88	47	93	47
Scranton, .....	72	40	78	40	83	83	53	76	39	64	48	54	68	49	76	44	70	43	87	50
Scranton, .....	71	46	74	38	86	90	73	58	68	42	72	50	73	48	77	42	88	47	93	47
Scranton, .....	72	40	78	40	83	83	53	76	39	64	48	54	68	49	76	44	70	43	87	50
Scranton, .....	66	34	73	31	73	55	68	37	57	39	63	50	68	49	76	44	70	43	87	50
Scranton, .....	67	37	82	43	80	83	70	45	68	52	63	48	70	45	72	46	78	40	87	51
Scranton, .....	68	44	76	43	83	80	70	45	68	50	63	48	70	45	72	46	78	40	87	51
Scranton, .....	68	44	76	43	83	80	70	45	68	50	63	48	70	45	72	46	78	40	87	51
Scranton, .....	71	47	76	35	71	50	71	51	61	63	77	57	74	53	73	59	78	60	81	67
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	67	46	63	39	72	46	71	53	74	44	79	43	87	48
Scranton, .....	68	41	76	35	83	81	6													

## Maximum and Minimum Temperatures for Pennsylvania, September, 1896.—Continued.

Stations.	11.		12.		13.		14.		15.		16.		17.		18.		19.		20.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	92	65	91	62	77	63	84	64	72	65	77	63	79	58	77	60	73	57	65	43
Aqueduct.	97	62	92	63	80	63	76	66	74	64	76	63	87	58	78	57	91	40	60	50
Bloomington.	90	61	82	65	80	64	75	66	74	64	72	64	75	54	75	60	78	49	59	38
Brookville.	88	71	88	78	84	70	84	72	86	74	79	67	77	66	77	64	79	61	76	53
Cannonsburg.	92	71	87	70	89	68	88	68	73	65	80	56	81	65	82	65	75	61	68	48
Carlisle.	97	65	93	64	85	65	73	67	73	66	80	56	87	56	87	63	87	55	70	49
Cassandria.	90	68	86	66	83	64	81	63	72	67	73	62	74	62	74	52	74	52	58	42
Center Hall.	93	62	81	69	84	63	82	61	77	65	72	50	77	56	77	58	76	54	63	44
Chambersburg.	93	63	77	69	80	68	74	65	73	68	78	60	82	60	73	61	85	60	66	50
Coatesville.	85	56	90	61	80	65	90	64	82	60	73	63	84	58	80	63	70	49	81	46
Confluence.	91	67	79	64	50	69	75	63	74	68	68	52	70	62	73	62	86	62	73	48
Coopersburg.	86	61	82	64	81	65	73	62	76	67	73	57	75	61	74	54	77	57	56	41
Darton.	87	72	84	62	71	65	82	65	76	67	72	57	72	55	75	48	82	62	73	44
Dyersburg.	86	61	82	64	81	65	73	62	76	67	73	57	72	55	74	48	82	62	73	44
Emporium.	87	72	84	62	71	65	82	65	76	67	72	57	72	55	74	48	82	62	73	44
Greensburg.	90	68	82	66	84	66	83	64	70	63	80	50	82	60	78	68	84	50	64	45
Hamilton.	91	67	85	66	89	70	77	62	72	69	76	46	77	60	78	63	79	63	59	42
Harrisburg.	91	67	85	66	89	70	77	62	72	69	76	46	77	60	78	63	79	63	59	42
Hollidaysburg.	95	61	92	60	88	64	84	62	72	60	78	52	80	58	79	60	75	53	68	38
Honesdale.	98	64	94	63	94	68	94	68	72	60	83	50	85	60	82	53	88	48	68	38
Huntingdon.	95	61	92	61	88	61	85	64	76	65	78	52	82	56	79	62	79	58	69	48
Indiana.	88	87	69	83	69	80	69	76	76	56	77	58	78	61	79	58	73	54	62	42
Irvine.	96	75	98	69	94	69	92	68	73	59	82	78	84	65	85	68	83	61	71	48
Johnstown.	90	64	77	60	71	64	73	63	73	65	79	59	81	63	77	63	82	61	67	47
Kennett Square.	90	60	88	62	90	64	91	65	86	63	84	62	85	63	82	60	80	60	80	61
Lancaster.	95	65	90	63	87	69	76	64	72	67	78	55	85	57	74	61	87	60	68	47
Lebanon.	92	65	89	67	86	58	81	59	70	54	72	44	78	57	75	53	73	49	66	38
Le Roy.	95	60	96	65	93	65	78	67	75	64	76	50	82	53	80	58	78	58	69	48
Lewistown.	96	63	93	65	78	66	87	62	73	66	77	48	80	53	80	56	76	62	70	47
Lock Haven.	94	58	87	61	84	60	72	61	75	67	79	53	78	59	78	52	81	61	65	46
Lycippus.	92	70	82	68	80	65	77	62	72	69	76	62	78	61	72	64	91	60	65	46
Mauch Chunk.	92	70	82	68	80	65	77	62	72	69	76	62	78	61	72	64	91	60	65	46
Philadelphia, (a)	92	70	82	68	80	65	77	62	72	69	76	62	78	61	72	64	91	60	65	46

Philadelphia, (6)	91	68	81	83	73	66	81	70	76	63	73	64	75	63	77	61	72	79	62	65	63	61	50
Pittsburg	92	71	83	78	63	73	82	68	76	64	73	69	76	66	78	62	71	79	61	62	63	66	48
Pottstown	93	60	80	69	59	65	82	65	78	60	74	61	78	66	80	67	65	71	61	58	58	66	50
Quakertown	92	63	82	65	65	77	65	65	84	63	76	63	75	66	76	55	76	76	54	74	50	65	45
Renovo	91	65	91	64	83	66	84	61	84	63	75	61	77	47	73	53	77	43	71	51	51	64	34
Scranton	91	65	91	64	83	66	84	61	84	63	75	61	77	47	73	53	77	43	71	51	51	64	34
Sellersburg	94	60	93	10	89	60	81	63	81	63	76	62	74	51	79	55	79	60	82	50	65	45	45
Shingle House	90	68	88	53	58	90	79	63	84	60	73	60	73	55	72	52	73	68	63	50	64	40	40
Smithport	89	55	90	79	75	63	84	60	71	61	73	60	73	46	75	52	74	48	67	51	62	40	40
Somers	92	60	88	78	82	76	88	58	74	65	74	49	69	58	77	55	72	74	45	65	65	39	39
South Eaton	90	60	90	65	65	71	64	74	74	76	74	49	69	58	77	55	72	74	45	65	65	39	39
State College	91	66	90	61	75	61	81	61	81	61	75	65	63	59	77	59	76	58	73	50	63	41	41
St. Marys	87	66	78	63	75	61	81	61	81	61	75	65	63	59	77	59	76	58	73	50	63	41	41
Swarthmore	87	64	78	62	75	63	82	61	70	61	73	63	74	63	76	66	73	65	73	50	63	45	45
Towanda	94	58	92	62	68	68	86	64	85	64	75	67	76	60	78	62	79	63	77	59	61	44	44
Uniontown	89	63	86	68	68	64	85	64	85	64	75	67	76	60	78	62	79	63	77	59	61	44	44
Warren	89	63	86	68	68	64	85	64	85	64	75	67	76	60	78	62	79	63	77	59	61	44	44
West Chester	88	64	77	64	77	68	72	62	72	62	72	62	72	62	72	62	72	62	72	62	62	48	48
Westtown	87	65	77	68	77	68	72	62	72	62	72	62	72	62	72	62	72	62	72	62	62	48	48
Wilkesbarre	86	60	92	60	81	64	77	68	72	62	72	62	72	62	72	62	72	62	72	62	62	48	48
Williamsport	90	63	89	67	81	64	77	68	72	62	72	62	72	62	72	62	72	62	72	62	62	48	48
York	93	64	88	67	84	67	84	67	70	65	73	69	77	57	85	59	73	64	90	60	63	43	43



Philadelphia, (b) .....	71	50	64	59	59	73	52	73	60	74	64	77	63	76	64	.....	78.1	53.8
Pittsburg, .....	68	47	63	49	51	70	43	75	58	74	55	70	58	58	51	.....	78.0	54.0
Quakertown, .....	71	47	61	52	54	70	38	76	54	76	59	78	62	72	62	.....	78.8	55.6
Renovo, .....	70	42	61	45	53	69	34	75	56	76	56	71	57	72	53	.....	78.9	55.1
Shelton, .....	70	34	61	43	57	68	28	73	51	73	58	66	50	64	44	.....	73.9	50.8
Shelton, .....	72	37	63	49	55	71	32	78	53	77	55	65	52	68	40	.....	73.5	50.1
Shelton, .....	70	33	60	50	54	74	28	74	50	70	50	72	58	74	58	.....	77.9	49.2
Shingle House, .....	69	33	59	50	54	74	28	76	52	74	50	72	58	74	58	.....	72.1	48.0
Shelton, .....	66	34	56	44	56	70	30	73	50	70	48	64	54	68	46	.....	70.5	46.4
Shelton, .....	62	40	58	33	55	68	32	70	48	76	55	64	51	64	40	.....	73.7	46.7
South Eaton, .....	67	50	62	38	53	70	40	72	51	76	55	66	58	73	64	.....	72.3	51.3
St. Marys, .....	66	34	60	47	51	72	31	75	50	73	55	66	58	73	64	.....	71.9	48.3
Swarthmore, .....	67	56	65	45	57	71	41	77	53	75	60	77	64	72	45	.....	73.7	49.1
Towanda, .....	70	37	62	45	52	74	33	74	56	70	60	77	67	73	54	.....	73.3	49.1
Uniontown, .....	67	45	58	45	57	71	33	73	50	74	54	72	57	63	46	.....	74.3	54.2
Warren, .....	67	39	61	41	56	70	33	75	55	77	65	75	61	68	47	.....	71.8	48.5
West Chester, .....	69	46	65	54	57	74	40	74	54	77	66	76	63	73	60	.....	74.8	57.3
Westtown, .....	68	41	66	50	56	70	36	73	50	73	59	75	63	73	60	.....	73.9	56.5
Wilkesbarre, .....	71	38	65	52	57	73	34	74	54	77	67	76	63	73	60	.....	78.0	61.3
Williamsport, .....	67	41	64	48	57	73	36	74	54	77	67	76	63	73	60	.....	78.0	61.3
York, .....	73	39	69	53	58	75	37	77	57	79	68	74	65	73	57	.....	77.4	53.5

## Daily Precipitation for Pennsylvania, September, 1896.

Stations.	Day of Month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Delaware Basin.																
Bethlehem.					1.95	1.67						.04			.03	.10
Blooming Grove.					.65	.09						†	.05		1.23	
Browers Lick.					.36	.50									.39	
Coustersville.					.47	2.07									1.60	
Coppersburg.					.13	1.08						.06	.02		.04	
Dyersburg.					.08	.86									.14	
Dyersburg.					1.15	.86						.03			.17	
Easton.					.20	1.00							†		.07	
Forks of Neshaminy.					•	2.59							.03		.20	
Frederick.					.04	.45						.03			.07	
Hamilton.					.17	.87						•	†		.36	
Hamlet.					•	3.09						•	.90	.04	.06	.03
Honesdale.					.18	1.85		.02								
Kennett Square.					.03	2.45						.06				
Lansdale.					.14	.73									.52	
Mauch Chunk.					.93	1.92						.02	.03		.20	
Mifflin.					.06										.08	
Philadelphia (a).					.39	.74						.01	.05	†	.43	
Philadelphia (b).					.12	1.50							.08		.40	
Point Pleasant.					.30	.40									1.40	
Port Jervis.					1.00	1.60						†		.03	.06	
Quakertown.					.34	2.45								.08	.50	
Rushville.					1.06	1.12							.17		.32	
Schubsville.					1.22	1.19									.31	
Shenandoah.					.61	2.02									.54	
Smith's Corner.					3.00									•	•	
Southampton.					2.04	1.04						†			.71	
West Chester.					1.90	1.20						.69	†	.06	.60	
Westtown.					.50	.40									.13	
White Haven.		.05														
Susquehanna Basin.																
Allentown.					.98	.03						.47	.01		.27	
Annapolis.					.40	.10						.30			.42	
Carlisle.					•	.46						•	.10	.05	.20	.15
Center Hall.					.71							1.16			.18	
Emporium.					1.13							†		†	.16	
Girardville.					.22	.12										
Granville.					•	.93						.15			.21	
Harrisburg.					.27	.03						.11		.02	.48	†





## Daily Precipitation for Pennsylvania, September, 1896—Continued.

Stations.	Day of Month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Delaware Basin.																	
Bethlehem.	.02	.50	.36			.04							1.30			3.03	
Blooming Grove.	.07	.63		1.23		.07							.12	1.83		6.02	
Brooks Lock.		.13	1.00			.07							.96	.37		8.57	
Coatesville.	.09		.26			.15						.06	.80	.66		6.03	
Coopersburg.	1.97	.41	.26			.11							.44	.73		5.89	
Doylestown.	.46		1.36			.12							.13	.70		4.10	
Dyersburg.	.57	.03	.08			.01							.46	.74		4.40	
Easton.	1.66	.06	1.63	.02		.04						.02	.84	.32		8.49	
Forks of Neshaminy.	.10		.09			.08							.11	.32		5.13	
Frederick.	.10		.19			.07							.06	1.20		4.94	
Hamburg.	.10		.64	.25		.10		.01					.75	.06		4.83	
Hamilton.	.20		1.03			.10						.05	1.10	.35		6.23	
Honesdale.	.21	.23	.10			.04							.91	.90		3.97	
Kennett Square.	.76		.35										.18	1.44		6.31	
Lansdale.	1.20		.43			.06							.30	.98		6.95	
Mauch Chunk.	.48		.17			.04							.27	.28		2.76	
Ottaville.	.19		.20	.02		.04							.42	.52		4.03	
Philadelphia (a).	.10		.29	.01		.03							.11			3.24	
Philadelphia (b).			.38					.19								6.33	
Point Pleasant.	.30		.20			.08							.19	1.24		7.11	
Pottstown.		.22	.21	.07		.07							.45	.50		3.66	
Quakertown.	1.56		.21			.06							.75	.85		5.13	
Reading.	.22	.14	.03			.07							.32	.37		4.77	
Reinoldsville.	.33		.39			.03							.35	.97		6.09	
Shawmont.	.09	.03	.20			.07							.94	.40		6.35	
Smiths Corner.	.43		.20			.03						.02	1.14	.45		6.97	
Swarthmore.	1.20		.25			.03							1.36	.08		3.71	
West Chester.	.72	.02	.12			.03										6.03	
Westtown.	1.11		.16			.01										6.03	
White Haven.	.43															6.03	
Susquehanna Basin.																	
Altoona.			1.11		.01	.03							1.83	1.96		6.03	
Aqueduct.		.10				.13							.15	.94		2.59	
Carlisle.		.03	.30			.02							1.09	.30		2.75	
Center Hall.			1.07			.21						.13	2.77			6.23	
Emporium.	.09		1.39			.06							1.90	.34		5.09	
Grandville.	.59		5.7			.12							1.13	.30		3.46	
Grampian.	.13		.75			.11						.06	.66	1.50		4.26	
Harrisburg.		.13	.25			.06							.26	.30		1.81	

Holidaysburg.	.04	.08	.57	.05	.09	3.42	.91	6.33
Huntingdon.			.41			1.01	1.76	6.96
Lebanon.					.29			
Lebanon.	.01	.44		.10		.70	.35	2.93
Le Roy.	.38	1.53	.65	.05	.15	.40	.43	3.87
Levittsburg.		1.50			.15	.37	.35	3.06
Lock Haven.	.25	1.37			1.35	.11		5.80
Renovo.	.54	1.49					2.33	5.49
Scranton.		1.20			.27			2.33
Selinsgrove.	.11	.49	.11			.24	.71	3.81
South Eaton.		.53			.08	.19	.51	2.45
State College.	†	.58	.08		.06	.51	2.40	5.02
Towanda.	.30	1.30	.08		.09	.20	.44	2.73
Wellboro.	.08	.76	†		.10	.50	.00	3.03
Wilkes-Barre.	.12	1.13					.49	2.36
Williamsport.	.86	.92			1.32	.07		3.71
York.		.30	.08	.10		.60	.30	2.54
Ohio Basin.								
Beaver Dam.	.06	.92	.28	.07		2.13		5.36
Brookville.				.19		.55	.35	1.73
Cantonburg.	.30	1.13	.14		1.5	1.50	2.40	6.77
Camdena.		.33	.62	.06	.05	.05	1.67	6.77
Confluence.		.33	.28	†	.23	.07	1.50	3.80
David Island Dam.	.05	.09	1.15	.41	.13		1.70	2.21
Day's Lake.		.35	.25		.40		1.35	4.73
Elwood Junction.		.74	.40		.43	.02		4.73
Frederick.		.43	.20	.43		.97	.72	4.30
Greensboro.	†		†	.20		2.50	.35	5.75
Indiana.	.13	.21	1.17		.04	1.36	.13	4.12
Irwin.						.01	.23	6.03
Johnstown.	†	.84	.57		.01	.07	2.24	4.57
Lock No. 4.		.73	.09	.08	.03	.08	1.57	4.59
Lycippus.		.01	.30	.02	.16		.43	4.40
Lycippus.	.05	.73	.35	.02	.35	†	1.40	4.24
Oil City.		.84	.25	†	.04	1.11	1.68	4.17
Parkers Landing.	†	1.07	.19		.04		.68	5.44
Pittsburg.	.01	.15	.23	.01	.25	.44	1.60	4.21
Ridgway.	.08	.75	.05	.12	.35	.44	.74	6.33
Saegertown.	.40	1.40		.20	1.28	2.13	2.13	6.33
Shingle House.	.43	1.25	.10	.05	.33	3.10	1.20	6.50
Smithport.		.40					2.07	5.15
Somerset.	°	1.45	.45	.04		1.35	.09	3.78
St. Marys.	.04	.25	.34	†	.23	.40	.75	6.03
Uniontown.	.67	1.77		.14	.02		2.13	4.41
Warren.		.09		.20				
West Newton.			†					
Potomac Basin.								
Chambersburg.		.02		.06		.53	.08	2.53
Lake Basin.								
Erie.	.54	.08	1.12	.23	†	.23	.25	3.72

† Trace, when precipitation is less than 0.01 inch.

° Precipitation included in that of the following day.

## CLIMATOLOGY OF THE MONTH.

## General Characteristics.

The month of October was favorable for outdoor operations, and late crops were secured in good condition. Both the average temperature and rainfall were slightly below the normal. The greatest amount of rainfall occurred in the northeastern counties and the least in the central southern and western.

## Atmospheric Pressure.

The mean pressure for the month, 30.08 inches, is normal. At the United States Weather Bureau stations the highest observed was 30.53 inches, at Harrisburg on the 10th, and the lowest, 29.64 inches, at Philadelphia on the 24th.

## Temperature.

The means of the maximum and minimum temperatures, 58.3 degrees and 39.5 degrees respectively, give a monthly mean of 48.9 degrees, which is 1.4 degrees below the normal, and 1.6 above the corresponding month of 1895.

The average daily range was 18.8°.

The highest monthly mean was 53.6°, at Philadelphia.

The lowest monthly mean was 44.1°, at Blooming Grove.

The highest temperature recorded during the month was 86°, on the 29th at Warren.

The lowest temperature was 18°, on the 26th at Blooming Grove.

The greatest local monthly range was 61°, at Warren.

The least local monthly range was 37° at Brookville and Philadelphia Weather Bureau.

The greatest daily range was 47°, at Lock Haven.

## Precipitation.

The average precipitation for the month, 3.19 inches, is 1.41 inches less than the normal.

The largest totals of rainfall, in inches, were: Williamsport, 5.70; Lewisburg, 5.58; Towanda, 5.57; Girardville, 5.55; Wellsboro, 5.40; Seisholtzville, 5.40. The least were: Elwood Junction, 0.94; Chambersburg, 1.52; Beaver Dam, 1.54; St. Marys, 1.63; Swarthmore, 1.64; Hollidaysburg, 1.81.

No. 197







## Wind and Weather.

The prevailing wind was from the west.

Average number of rainy days, 9; clear, 11; partly cloudy, 8; cloudy, 12.

## Miscellaneous Phenomena.

Thunderstorms.—Renovo, 31; Saegerstown, 28; Emporium and St. Marys, 30.

Hail.—Cassandria, 18.

Snow.—18, 19, 24.

Aurora.—Le Roy, 8, 9, 10; State College, 10.

Coronae.—Philadelphia, Centennial Ave., 16.

Solar Halo.—Towanda, 29; Philadelphia, Centennial Ave., 20, 28, Wellsboro, 11.

Lunar Halo.—Philadelphia, Centennial Ave., 20; Wellsboro, 11.



## Climatological Data for Pennsylvania, October, 1896.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.					Precipitation, in inches.				Sky.			Prevailing wind direction of			
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in twenty-four hours.	Total snowfall (un-melted).	Number rainy days.		Number clear days.	Number partly cloudy days.	Number cloudy days.
Pittsburg.	Allegheny.	842	25	50.5	-4.0	79	30	25	31	2.25	-0.15	0.69	.....	13	11	10	10	8	W
Hamburg.	Berks.	380	6	51.0	-1.3	73	31	24	20	37	4.25	+0.69	3.05	.....	7	10	13	8	NW
Reading 2.	Berks.	280	8	48.8	-1.2	71	29	24	26	41	2.31	-1.03	1.55	.....	10	13	8	10	NW
Altoona.	Blair.	1,131	8	48.0	-2.5	75	29	24	26	41	2.28	-0.47	0.44	.....	14	7	6	10	W
Hollidaysburg.	Blair.	947	8	48.2	-0.2	77	29	23	25	33	1.81	-0.97	0.45	.....	13	7	6	10	NE
Le Roy.	Bradford.	1,400	7	45.8	-2.0	77	29	23	25	33	5.04	+1.46	2.10	T	13	7	6	10	NE
Towanda.	Bradford.	764	7	46.6	-2.0	74	29	23	25	40	5.57	+1.46	2.10	T	13	7	6	10	NE
Forks of Neshaminy 1 a.	Bucks.	304	7	50.7	-1.4	74	29	23	25	40	2.17	-1.65	0.62	.....	13	7	6	10	NW
Quakertown.	Bucks.	538	21	49.0	-2.3	71	31	25	26	35	3.50	+0.03	2.43	.....	13	7	6	10	NW
Cassandria.	Cambria.	2,100	69	48.0	-3.0	76	30	25	26	33	2.89	-0.71	1.01	T	14	7	6	10	NW
Johnstown.	Cambria.	1,134	11	48.8	-3.0	76	30	25	26	33	3.15	-0.73	1.01	T	13	8	13	10	NW
Emporium.	Carbon.	1,050	6	48.0	-3.0	74	29	24	26	35	3.31	-0.08	1.28	T	11	13	10	8	NW
East Mauch Chunk.	Carbon.	550	6	48.3	-1.3	73	31	23	25	40	4.16	+0.51	1.62	.....	10	11	6	14	W
State College.	Centre.	1,191	8	47.2	-1.5	73	29	27	28	27	2.29	+0.34	1.31	.....	10	9	9	15	W
Centre Hall.	Centre.	775	79	47.5	-1.5	73	29	27	28	27	2.92	+0.34	1.31	.....	7	15	6	8	W
West Chester.	Chester.	465	40	51.5	-3.0	73	31	23	25	28	2.14	-3.18	1.16	.....	8	17	3	11	NW
Coatesville.	Chester.	280	8	50.0	-0.6	77	31	25	26	25	2.96	-0.89	2.13	.....	8	16	3	11	NW
Kennett Square.	Chester.	276	6	51.6	0	77	31	25	26	25	2.51	-1.07	1.54	.....	8	16	3	11	NW
Westtown.	Chester.	260	7	50.4	-1.3	72	31	25	26	23	2.40	-1.90	1.53	.....	6	11	9	11	NW
Grampian.	Clearfield.	1,450	21	45.6	-3.1	73	29	24	26	30	2.63	-0.26	0.60	.....	9	6	17	9	W
Lock Haven.	Clinton.	540	8	50.8	-0.8	73	29	24	26	30	2.63	-0.26	0.60	.....	9	6	17	9	W
Aspers.	Clinton.	1,200	4	48.2	-3.1	76	29	25	26	33	4.91	+1.56	.....	.....	9	13	8	11	W
Scranton.	Crawford.	1,200	4	48.2	-3.1	76	29	25	26	33	4.15	-2.00	.....	.....	10	15	10	6	SW
Carthage.	Cumberland.	480	8	50.7	-0.5	75	29	27	10	41	2.35	-0.21	0.54	T	11	7	10	14	W
Harrisburg.	Dauphin.	201	9	50.9	-1.1	71	29	27	10	41	2.78	-1.34	1.00	.....	7	16	7	8	W
Swatara.	Delaware.	190	7	51.8	-0.8	71	29	23	25	30	2.45	+0.27	2.23	.....	10	10	7	14	NW
St. Mary's a.	Delaware.	190	7	51.8	-0.8	71	29	23	25	30	2.45	+0.27	2.23	.....	10	10	7	14	NW
Elk.	Ella.	1,200	7	44.8	-3.6	70	29	23	25	34	1.83	-2.30	1.20	.....	4	9	13	10	NW
Minersville.	Ella.	1,200	7	45.0	-3.6	70	29	23	25	34	1.83	-2.30	1.20	.....	4	9	13	10	NW
Wellsburg.	Erie.	1,400	24	48.4	-1.6	73	29	23	25	34	3.01	-1.03	0.53	.....	11	10	9	13	NW
Uniontown.	Franklin.	681	8	50.8	-3.2	73	29	23	25	34	3.01	-1.03	0.53	.....	11	10	9	13	NW
Chambersburg.	Franklin.	1,000	5	48.2	-1.3	73	29	23	25	41	1.83	-2.31	0.87	.....	7	13	9	13	SW

[illegible]

Extremes of temperature from observed readings of dry thermometers.

Extremes of temperature from observed readings  
Mean of 7 A. M. + 2 P. M. + 9 P. M. — 4.

TABLE 10. A. 2. F. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838.

## Maximum and Minimum Temperatures for Pennsylvania, October, 1896.

Stations.	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.		11.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	62	48	66	50	66	38	61	43	63	41	63	37	55	40	55	37	57	27	58	27	57	41
Aqueduct.	70	47	66	51	65	42	64	46	59	45	67	47	58	44	55	37	55	38	58	30	60	43
Blooming Grove.	59	43	53	44	53	35	63	46	53	44	56	45	51	38	43	32	50	27	53	29	49	35
Brookville.	68	54	61	47	67	58	65	43	66	52	68	49	63	41	64	46	68	49	63	55	69	51
Cannonsburg.	68	47	62	48	67	38	65	43	71	43	62	43	61	41	63	39	63	33	66	27	61	38
Carlisle.	67	51	69	51	69	39	61	43	60	40	70	39	69	42	69	39	68	60	60	56	66	49
Cassandra.	56	50	58	46	58	38	59	40	58	46	60	37	45	36	49	37	52	28	54	23	53	40
Centre Hall.	61	40	64	47	68	37	55	47	62	45	63	36	56	42	58	35	55	30	55	30	55	36
Chambersburg.	67	48	66	49	67	40	59	47	62	45	68	34	59	42	56	35	57	26	53	29	54	42
Coatesville.	66	53	66	52	66	42	57	54	59	48	64	50	61	45	52	37	52	28	53	29	54	42
Confluence.	70	49	60	50	60	46	65	40	65	40	70	45	67	42	51	30	46	28	57	28	60	32
Coopersburg.	67	54	66	53	65	52	58	53	58	50	61	53	55	49	52	40	62	32	57	27	53	43
Derry.	69	48	69	50	61	41	64	41	64	39	68	38	65	44	49	40	53	29	56	33	53	43
Drifton.	62	45	54	42	56	48	56	47	56	46	55	48	52	47	48	37	52	25	55	22	52	37
Dyberry.	65	52	64	53	65	49	58	52	58	49	61	51	58	45	54	39	49	30	53	31	52	41
Easton.	56	50	62	47	55	39	56	43	56	40	57	40	54	42	51	40	54	31	58	28	64	30
Emporium.	56	49	54	48	54	42	54	42	56	42	56	42	46	40	49	40	48	36	58	49	55	42
Erie.	60	50	60	50	58	36	56	44	58	34	60	36	54	40	46	36	50	28	52	28	56	38
Gettysburg.	50	52	59	49	69	40	60	49	67	41	69	42	57	44	56	37	56	40	60	30	64	30
Greensburg.	60	49	55	43	56	47	56	47	56	47	57	47	52	42	43	36	47	30	56	25	58	31
Halstead.	67	54	67	52	65	51	60	53	58	50	63	52	58	51	51	38	55	29	59	32	56	40
Hamburg.	62	48	55	44	56	47	56	47	56	47	56	47	54	47	43	34	54	31	60	26	51	34
Hamilton.	65	54	63	55	62	46	58	50	56	51	65	46	56	48	54	43	55	32	57	23	58	38
Harrisburg.	64	43	67	35	67	35	65	40	67	41	66	38	58	40	57	36	59	27	59	25	58	38
Holidaysburg.	67	47	67	43	69	37	63	44	63	43	64	38	59	45	58	40	57	40	57	40	55	38
Honesdale.	68	48	63	47	61	38	64	41	63	43	64	38	59	45	58	40	57	40	57	40	55	38
Huntingdon.	67	53	66	47	72	53	63	47	63	47	63	47	52	42	42	36	68	36	63	46	66	38
Indiana.	61	48	61	49	62	43	62	41	62	41	62	41	49	40	51	38	59	28	57	36	60	47
Johnstown.	66	52	69	52	69	45	58	53	59	50	66	51	60	47	61	36	56	26	55	32	54	44
Kennett Square.	71	56	72	58	66	56	63	60	63	60	66	48	59	35	60	38	54	29	56	32	54	44
Lebanon.	67	51	60	52	63	39	63	45	59	47	67	45	58	46	58	38	57	27	60	29	57	30
Le Roy.	68	48	54	40	62	42	53	42	50	44	60	42	43	36	46	34	45	32	54	28	50	32
Lewistown.	66	58	68	44	60	40	58	48	57	48	65	40	57	44	53	34	58	27	63	26	59	32
Lock Haven.	65	59	72	50	66	41	60	45	55	43	64	40	57	45	57	38	63	31	60	30	61	34



## Maximum and Minimum Temperatures for Pennsylvania, October, 1896.—Continued.

Stations.	12.		13.		14.		15.		16.		17.		18.		19.		20.		21.		22.	
	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.
Altoona.	46	42	51	42	52	43	65	42	60	46	55	39	44	34	48	26	53	33	51	31	55	26
Aqueduct.	46	45	50	47	56	42	72	43	60	43	61	49	50	34	50	27	51	43	61	36	52	27
Blooming Grove.	49	36	47	40	48	39	59	38	57	42	47	34	45	35	42	24	46	46	46	36	54	26
Brookville.	66	47	68	46	70	41	64	42	62	38	60	44	61	39	59	33	59	45	57	40	52	38
Cannonsburg.	57	41	61	41	62	41	72	39	65	43	54	41	47	36	58	28	54	31	56	39	55	31
Carlisle.	52	44	51	45	57	45	71	47	66	46	48	45	56	38	58	28	45	45	37	49	57	29
Cassandria.	46	42	48	41	48	42	60	37	55	43	49	42	43	38	45	29	51	37	49	38	49	29
Centre Hall.	55	41	46	41	49	42	65	39	59	50	53	41	52	38	45	29	50	31	51	30	49	31
Chambersburg.	52	40	51	43	54	42	56	43	66	39	65	40	57	42	53	37	52	23	49	31	61	30
Coatesville.	47	43	49	45	53	47	65	47	69	41	52	44	49	41	51	29	58	30	66	47	54	29
Coatesville.	58	35	60	42	52	42	60	45	64	36	57	38	56	36	50	30	52	35	48	32	52	34
Confluence.	49	43	50	45	54	47	74	46	65	47	52	45	53	44	52	34	52	34	63	44	59	35
Coopersburg.	61	40	52	45	54	44	53	37	62	41	58	40	53	44	51	30	49	39	52	44	47	28
Derry.	52	39	45	41	49	44	63	38	59	33	48	34	43	35	60	27	54	28	55	30	49	28
Drifton.	50	43	51	44	56	47	63	45	65	40	58	43	43	42	48	30	52	34	62	40	55	22
Dyberry.	46	40	50	40	51	44	64	34	64	34	59	40	43	34	43	28	54	32	51	32	52	26
Emporium.	49	45	50	44	56	48	62	43	52	46	27	40	42	38	43	32	52	40	50	38	46	33
Erie.	41	42	46	44	46	42	64	40	58	44	56	42	42	38	40	36	50	42	44	34	46	26
Gettysburg.	57	35	56	34	56	44	56	36	56	36	42	46	43	46	38	51	31	49	39	59	27	27
Greensboro.	53	41	52	42	54	44	61	43	56	35	40	38	46	37	43	30	49	42	56	46	44	31
Hallstead.	47	46	50	46	54	48	66	46	60	40	51	43	49	46	52	30	49	42	64	46	56	34
Hamlet.	45	38	44	41	47	42	61	40	60	41	50	35	40	34	42	24	44	38	54	38	50	29
Hamilton.	46	43	50	45	56	46	67	50	63	52	53	48	50	43	50	24	47	37	60	45	53	35
Harrisburg.	51	43	52	43	53	43	66	38	61	46	57	39	46	36	53	24	56	30	53	33	56	34
Holidaysburg.	52	42	43	39	44	43	63	36	63	41	56	40	52	38	50	27	54	40	56	40	51	34
Honesdale.	57	45	51	42	53	44	69	39	56	38	41	36	43	35	68	27	54	40	56	40	51	34
Huntingdon.	57	45	51	42	53	44	69	39	56	38	41	36	43	35	68	27	54	40	56	40	51	34
Indiana.	57	45	51	42	53	44	69	39	56	38	41	36	43	35	68	27	54	40	56	40	51	34
Irwin.	50	44	51	43	54	42	67	57	74	42	48	38	44	36	58	28	53	46	43	40	54	29
Johnstown.	49	41	51	44	55	46	66	46	66	46	47	66	43	67	38	53	43	60	39	57	30	
Kennett Square.	56	36	53	38	63	41	64	42	66	40	54	44	50	40	50	29	46	43	61	31	55	29
Lancaster.	51	40	49	44	54	46	67	43	66	40	54	44	50	40	50	29	46	43	63	37	51	29
Lebanon.	44	36	44	40	46	40	60	39	60	40	52	36	40	30	46	26	46	34	63	30	54	29
Le Roy.	50	43	48	43	52	45	69	39	62	40	51	40	48	33	46	29	49	52	58	33	51	29
Lewistown.	64	45	63	44	56	45	74	33	75	40	51	40	48	33	46	29	49	52	58	33	51	29
Lock Haven.	64	45	63	44	56	45	74	33	75	40	51	40	48	33	46	29	49	52	58	33	51	29

59	42	53	43	51	41	51	40	63	43	53	39	53	40	41	39	59	53	43	51
47	44	48	44	51	48	55	46	45	40	43	38	46	38	50	39	59	40	56	44
51	46	50	46	55	48	56	50	71	48	57	47	50	41	53	37	53	32	53	36
50	46	50	46	55	47	58	49	73	45	57	46	50	47	53	37	53	32	53	36
52	45	53	44	53	46	53	39	77	45	57	45	50	47	53	37	53	32	53	36
40	45	50	46	55	49	67	45	67	45	57	46	50	47	53	37	53	32	53	36
48	41	50	43	54	45	65	44	67	38	53	38	40	40	50	37	53	32	53	36
46	41	48	44	50	45	60	41	61	43	54	43	45	35	44	37	53	32	53	36
61	41	50	40	57	30	67	37	61	39	50	35	45	31	47	26	52	32	49	29
58	40	48	43	50	45	64	40	65	35	58	40	49	35	48	37	50	34	56	35
55	37	48	43	50	45	64	40	65	35	58	40	49	35	48	37	50	34	56	35
58	40	48	43	50	45	64	40	65	35	58	40	49	35	48	37	50	34	56	35
64	25	54	40	50	40	59	29	68	38	57	47	40	55	43	51	39	53	38	51
55	45	50	45	51	45	56	46	68	38	57	47	40	55	43	51	39	53	38	51
43	40	47	40	54	40	63	28	54	37	40	36	41	32	40	31	47	28	46	38
54	40	48	38	56	38	60	35	56	42	46	32	46	25	48	31	47	28	46	38
49	45	47	43	49	45	52	43	61	37	53	38	46	38	50	39	59	40	56	44
47	40	46	40	50	42	54	46	58	44	53	39	49	35	45	25	53	32	53	36
45	40	44	41	48	40	55	34	57	34	44	38	41	35	45	25	53	32	53	36
50	47	52	41	55	50	57	47	60	43	57	47	50	36	50	38	53	46	36	54
52	41	46	43	55	44	53	38	61	33	49	39	46	36	56	39	51	41	43	48
53	45	55	44	53	44	53	37	60	40	51	37	46	36	56	39	51	41	43	48
57	40	47	40	57	43	62	37	70	40	51	37	46	36	56	39	51	41	43	48
47	43	49	45	53	47	65	47	69	46	54	46	50	43	50	32	60	33	54	53
48	43	48	45	53	46	64	47	69	46	54	46	50	43	49	32	61	33	54	53
54	35	57	42	50	44	63	40	60	38	55	31	54	30	53	28	50	31	54	31
46	41	48	43	52	45	70	41	62	41	51	41	46	40	45	34	50	34	50	31
52	45	51	45	56	45	68	41	66	45	53	46	52	40	51	28	53	36	68	43
Lyddius.																			
Mauch Chunk.																			
Philadelphia (a).																			
Philadelphia (b).																			
Pittsburg.																			
Pottstown.																			
Quakertown.																			
Renovo.																			
Rogers town.																			
Scranton.																			
Sellingrove.																			
Shilling House.																			
Shippack.																			
Smithport.																			
Somerset.																			
South Bethlehem.																			
South Eaton.																			
State College.																			
St. Mary's.																			
Swarthmor.																			
Towanda.																			
Trenton.																			
West Chester.																			
White Haven.																			
Williams-Barre.																			
York.																			

## Maximum and Minimum Temperatures for Pennsylvania, October, 1896.—Continued.

Stations.	23.		24.		25.		26.		27.		28.		29.		30.		31.		Monthly Mean.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Allentown.	47	32	47	36	52	36	65	34	70	32	68	39	75	45	72	57	68	44	58.4	37.7
Aqueduct.	52	41	51	39	55	40	61	28	72	33	70	35	76	53	65	50	73	47	60.1	40.6
Bloomington.	52	30	48	28	41	20	46	18	58	38	58	34	69	44	62	48	64	45	52.7	35.5
Brooklyn.	50	30	46	28	48	30	46	20	54	36	59	32	66	40	62	48	64	43	52.7	35.5
Canonsburg.	49	26	43	26	48	26	50	21	57	37	70	41	80	51	81	63	71	48	63.8	40.5
Carlisle.	49	26	43	26	48	26	50	21	57	37	70	41	80	51	81	63	71	48	63.8	40.5
Cassidy.	49	26	43	26	48	26	50	21	57	37	70	41	80	51	81	63	71	48	63.8	40.5
Centre Hall.	45	32	51	36	49	26	64	24	69	34	68	38	73	50	64	51	66	51	58.6	37.4
Chambersburg.	52	32	47	32	51	36	64	24	69	34	68	38	73	50	64	51	66	51	58.6	37.4
Coatsville.	54	33	53	41	51	29	60	36	69	33	66	34	72	47	68	44	76	50	59.2	37.7
Confluence.	54	33	53	41	51	29	60	36	69	33	66	34	72	47	68	44	76	50	59.2	37.7
Coopersburg.	55	41	55	43	60	35	65	31	74	39	62	41	76	51	68	52	73	46	58.9	38.9
Derry.	52	37	47	30	45	31	49	31	60	32	61	38	69	46	74	59	72	49	58.1	39.9
Drifton.	53	35	45	34	43	30	58	23	67	28	60	31	72	45	63	43	68	51	55.0	36.4
Dyersburg.	56	38	50	41	46	33	56	24	64	33	58	37	66	51	60	47	67	57	57.3	42.0
Easton.	51	26	45	32	51	31	59	24	56	26	67	33	74	40	70	48	65	42	55.7	36.4
Emporium.	48	35	42	40	48	36	62	38	63	48	69	50	74	59	78	61	62	49	54.2	42.6
Erie.	44	30	40	32	46	25	54	24	64	34	66	38	73	44	68	54	64	46	53.5	37.7
Gettysburg.	51	35	50	36	50	35	67	28	71	38	70	36	78	45	60	50	68	48	60.5	38.3
Greensboro.	54	25	46	31	43	29	58	21	59	29	62	32	73	50	65	44	62	47	53.8	37.5
Halstead.	52	35	52	44	54	29	60	28	71	34	69	36	73	50	67	47	73	56	59.0	43.0
Hamburg.	53	33	41	34	45	33	41	27	58	39	67	42	74	38	70	54	70	54	54.2	38.6
Harrisburg.	50	40	40	44	51	33	60	34	64	39	67	42	71	51	68	53	70	52	57.9	43.9
Hollidaysburg.	48	30	49	35	55	23	67	23	72	27	68	31	77	41	42	40	72	45	60.3	30.1
Honesdale.	56	32	48	36	54	26	66	26	72	28	68	34	78	44	71	45	71	51	60.0	36.0
Huntinton.	50	34	45	36	50	36	60	35	68	42	72	51	76	57	73	44	71	43	59.8	39.0
Indiana.	48	39	55	34	57	31	67	26	75	42	77	50	81	67	84	53	73	49	63.4	44.6
Irwin.	47	35	46	35	51	28	58	31	67	37	67	40	71	48	76	60	60	50	56.8	40.7
Johnstown.	59	39	58	41	53	29	61	28	73	34	68	37	73	50	72	49	77	54	61.7	41.6
Kennett Square.	54	30	62	43	63	42	71	52	73	52	71	35	76	56	68	48	69	51	62.9	43.2
Lancaster.	50	38	64	41	70	25	69	30	74	31	73	35	76	50	74	49	74	50	61.4	40.0
Lebanon.	50	30	48	32	45	26	67	28	71	39	63	40	77	49	73	53	64	50	54.4	37.1
Le Roy.	48	30	51	36	54	23	61	28	68	29	65	33	73	49	63	46	70	44	58.2	37.7
Lewisburg.	53	33	57	31	60	30	65	26	70	32	81	34	75	40	73	47	75	45	63.6	38.1
Lock Haven.	53	33	57	31	60	30	65	26	70	32	81	34	75	40	73	47	75	45	63.6	38.1

52	39	48	33	45	30	58	40	37	60	43	68	44	71	56	74	63	77	49	50.2	40.5
54	41	50	30	40	36	58	50	35	58	32	62	32	72	50	64	45	73	54	50.1	30.5
58	46	58	42	52	37	62	37	62	30	47	64	52	72	60	73	55	78	63	50.3	47.0
58	47	58	44	54	35	68	37	71	44	47	64	45	74	50	73	55	78	68	50.9	46.4
58	38	48	36	53	30	66	35	71	40	40	64	45	76	53	70	54	66	52	50.9	46.0
55	41	53	41	52	32	62	30	70	34	40	64	37	71	51	63	70	52	52	50.0	42.2
54	43	53	43	53	30	60	30	70	31	63	34	37	71	45	69	48	71	52	58.4	39.5
42	39	42	35	53	30	60	28	69	30	67	38	74	76	45	62	48	66	44	50.9	39.4
50	20	47	25	50	28	65	19	25	68	28	68	34	74	46	78	45	69	39	58.2	32.3
52	30	48	38	40	30	49	35	68	31	65	34	35	73	44	65	45	60	36	56.6	30.8
54	36	52	28	50	28	68	29	70	62	34	58	45	72	44	70	38	69	39	59.9	37.2
50	21	47	19	51	21	61	25	76	34	74	44	74	63	56	74	38	73	50	61.2	39.1
57	33	56	46	56	30	61	25	63	29	71	38	63	74	75	42	71	67	38	56.2	32.9
50	21	42	30	51	30	61	20	69	28	62	38	75	42	43	63	47	63	35	56.2	32.9
46	38	48	28	50	22	60	23	67	30	68	28	72	45	68	48	62	42	42	56.3	35.4
South Bethlehem.																				
54	30	50	36	46	36	59	26	66	29	64	33	72	72	50	65	47	71	51	56.0	39.7
50	31	44	36	50	27	62	26	66	36	65	35	72	75	51	66	59	67	52	56.6	38.7
47	26	46	32	48	30	65	31	70	38	66	31	70	75	45	68	29	60	52	55.0	34.3
59	49	53	36	46	33	57	37	66	45	63	45	71	75	70	65	55	60	58	56.6	45.1
49	31	52	28	46	26	60	23	68	28	67	33	74	49	66	70	57	68	52	56.2	37.7
48	40	48	37	53	28	66	30	70	35	71	42	78	50	78	60	63	67	49	59.3	42.0
58	25	41	27	62	33	70	25	70	30	76	50	86	63	81	43	84	46	46	61.0	38.6
56	44	58	41	51	33	60	34	70	42	68	45	72	60	73	56	58	53	54	58.9	44.1
55	38	55	41	59	30	58	29	68	35	60	38	70	70	60	72	52	73	54	58.1	42.7
West Chester.																				
52	30	51	37	49	29	58	26	66	30	66	32	72	72	51	67	46	69	46	58.7	38.1
48	31	53	30	56	27	65	27	66	35	65	36	70	75	52	64	51	70	53	50.4	40.2
52	40	51	41	52	30	62	28	69	29	70	36	75	50	69	69	59	71	52	59.7	40.9
York.																				



## Daily Precipitation for Pennsylvania, October, 1896.

Stations.	Day of Month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
<b>Delaware Basin.</b>																
Bethlehem.....			.02				.11					.80	1.16			
Blooming Grove.....					†		.13					1.70	1.05	17		
Brown's Lock.....				.06			.08				.06	2.07	1.34	.09		
Coatesville.....				.03			.01					1.32	.98	.09		
Coopersburg.....				.21	.01		.03				.06	.91	.63	.08		
Doyertown.....				.12								.68	1.19	.10		
Dubarry.....	.09						.10							1.47		
Easton.....					.07											
Forks of Nehaminy.....				.25		.02	.03				.06	.62	.67	.10		
Federick.....				.30			.04					2.16	1.06	.09		
Hamburg.....				.17		.06						3.06	.11			
Hamlington.....	.04		.03	.01		†	.28					.80	2.18	.25	.11	
Honesdale.....						.26										
Kennett Square.....				.02			.03				.02	1.64	.38	.12		
Lansdale.....			.02	.10								.94	1.45	.63		
Mauch Chunk.....							.21					1.62	1.00	.15		
Ottaville.....				.04								1.00	.80	.08		
Philadelphia (a).....				.11	†	†	†			.02		.68	.90	.03		
Philadelphia (b).....				.07			.02			.05		1.24	.91	.04	†	
Point Pleasant.....										.06		.80	.83	.04		
Pottstown.....				.10	.02		.06					3.00	.30			
Quakertown.....				.29						†		.88	1.55	.11		
Reading.....				.01	.01							1.56	.68	.08		
Seisholtzville.....				.96	.01							2.33	1.11	.36		
Shawmont.....				.13			.03			.01		1.26	1.20	.05		
Skippack.....												.76	.78	.07		
Smiths Corner.....				.12		.06				.06		1.30				
Swarthmore.....				.20						.09		1.16	.33	.06		
West Chester.....				.10			†					1.53	.37	.96		
Westtown.....				.08			†					1.78	.90	.09		
White Haven.....				†		.14										
<b>Susquehanna Basin.</b>																
Altoona.....	.02					.17	.13					.44	.29	.17		
Aqueduct.....							.10				2.30	.30	.26	.23		
Carlisle.....				.07								.90	1.00	.06		
Center Hall.....	.10					.37						1.68	.46			
Emporium.....						.15	.31	.03				1.28	.24	.26		
Girardville.....				.04						.04		3.00	.74	.24		
Grampian.....							.36					.60	.44	.33		
Haltstead.....	.01						.30					.34	1.78	.28		



## Daily Precipitation for Pennsylvania, October, 1896—Continued.

Stations	Day of Month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Delaware Basin.																	
Bethlehem.				.11			.47	.50								2.77	
Blooming Grove.		.07			.23		.02	.43						.0		3.51	
Brothers Lick.							.12	.25								3.47	
Coatesville.				.08			.16	.40								2.96	
Coopersburg.							.10	.39								3.29	
Doylstown.							.22	.35					.03			2.19	
Dyersburg.		.08		.37			.06	.43								3.07	
Easton.	†	.03		.02			.05	.42					.01		.01	2.38	
Forks of Neshaminy.							.05	.44					.02			2.17	
Federick.				.16			.08	.38						.02		4.06	
Hamburg.		.05	.02	.16	.04											4.25	
Hamilton.			.19		.28			.36								4.35	
Honesdale.							.08	.26								3.29	
Kennett Square.							.09	.23						†		3.51	
Lancaster.				.24	.04		.18	.53						†		4.13	
Landis Chuk.		.02					.07	.49								3.55	
Ottaville.				.01			.11	.30						†		3.08	
Philadelphia (a).		†			†		.10	.30						†	†	2.77	
Philadelphia (b).		†					.07	.38								3.95	
Point Pleasant.							.06	.51								3.50	
Pottstown.					.03		.15	.26						†		3.81	
Quakertown.	†	.01		.06			.25	.30								5.40	
Reading.							.03	.27								3.94	
Seiboltsville.				.09			.09	.43								2.89	
Shawmont.							.14	.37								1.64	
Skippack.							.13	.27						.01		2.14	
Smiths Corner.							.15	.28						†		3.40	
Swarthmore.							.33	.20								2.29	
West Chester.																1.64	
Westtown.	†						.15	.23						.01		2.14	
White Haven.		.12		.44	.04		.33							.19		2.40	
Surquehanna Bas n.																	
Altoona.	.02	.10	.09	.40	.01		.37	.04						.03		2.28	
Aqueduct.				.34	.03		.35	.36								2.53	
Carlisle.		.23	.51	.28			.46							.04		2.78	
Center Hall.																3.92	
Emporium.		.13	†	.06	.07	.57	†									3.31	
Girardville.		.50	.06				.51	.10						.07	.09	5.65	
Grampian.		.22	.06				.30							.08		5.65	
Hallstead.		.23		.23				.30						.10		2.63	
Haltstead.		.22		.10	.05		†	.20						.09	.01	3.38	







## Miscellaneous Phenomena.

Thunderstorms.— 5, 6.

Snow.—8, 13, 14, 20, 21, 22, 23, 29, 30.

Aurora.—Le Roy, 5.

Solar Halo.—Harrisburg, 10.

Lunar Halo.—Cassandria, 17; Harrisburg, 12, 18; Lebanon, 12;  
Philadelphia, 18; State College, 26; York, 12.

## Climatological Data for Pennsylvania, November, 1896.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.				Precipitation, in inches.				Sky.							
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Four hours.	Total snowfall (unmelted).	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.	Prevailing wind.
Altoona.	Blair.	1,181	8	45.6	+5.0	73	18	20	30	35	2.80	-0.63	0.81	T	19	9	13	8	NW
Aqueduct.	Perry.	367	7	46.2	+4.6	76	17	20	30	37	3.47	+0.31	1.30	T	8	9	13	8	NW
Blooming Grove.	Pike.	8	41.0	+4.2	67	1	12	23	33	33	6.40	+2.11	3.80	2.2	9	4	9	17	NW
Brookville.	Jefferson.	10	47.4	.....	70	26	22	30	30	34	3.13	-0.08	0.57	1.0	11	21	0	9	W
Cannonsburg, a.	Washington.	936	22	50.5	+10.8	79	17	19	30	36	1.64	-0.81	0.43	.....	7	8	9	12	W
Cumberland.	Cumberland.	480	8	47.2	+6.2	77	18	23	33	41	3.59	+0.23	1.86	T	9	17	8	5	W
Cassadonia.	Cambria.	2,100	44.3	.....	70	27	19	30	30	30	3.10	.....	0.51	3.0	13	3	10	17	NW
Center Hall.	Center.	1,000	45.9	.....	70	18	21	30	29	29	3.11	.....	1.35	T	6	10	8	12	W
Chambersburg.	Franklin.	380	5	46.8	+3.0	74	27	19	23	40	4.20	+1.70	2.70	.....	8	11	3	16	W
Coatesville.	Chester.	380	8	47.7	+6.3	77	18	21	23	43	4.35	+0.38	1.80	4.9	10	17	3	10	S
Confluence.	Somerset.	20	44.2	.....	83	28	21	10	34	34	3.88	+0.69	1.31	.....	15	6	2	23	W
Coopersburg.	Lehigh.	520	6	49.1	+8.2	78	2	24	23	36	4.87	+1.71	2.65	1.1	13	11	9	10	SE
Derry, a.	Westmoreland.	6	46.6	.....	75	27	21	30	30	30	2.96	.....	0.97	.....	11	11	1	17	.....
Irifiton.	Luzerne.	1,100	30	40.8	+4.8	70	27	17	23	36	3.43	+0.33	1.46	0.5	8	6	12	13	W
Judy-ry.	Wayne.	1,325	12	45.8	+4.6	68	27	24	23	29	4.46	+1.28	1.08	.....	8	7	5	18	W
Easton.	Northampton.	1,320	7	41.4	+4.8	70	26	17	30	37	3.60	+0.16	0.91	2.3	10	7	10	13	W
Edinboro, * 1	Erie.	1,060	8	44.4	+4.9	70	26	17	30	34	2.92	-0.63	0.59	.....	15	4	10	16	SW
Emporium.	Cameron.	1,400	24	44.3	+2.3	70	26	30	30	27	2.96	+0.61	2.23	4.0	11	13	2	15	W
Erie.	Erie.	1,400	31	49.8	+7.8	70	26	16	30	30	3.56	+0.80	0.52	7.0	10	3	15	12	SW
Forks of Neshannony, 1 c	Rucks.	1,450	7	45.1	+7.8	70	26	16	30	30	3.26	-0.34	0.75	.....	6	3	11	17	SW
Grampian.	Greene.	1,390	5	47.2	+4.4	73	27	19	23	34	3.77	+0.35	2.00	1.0	14	2	11	14	SW
Greensboro.	Susquehanna.	1,400	7	44.2	+7.0	73	27	19	23	30	3.75	+0.35	2.00	1.0	14	2	11	17	SW
Hallstead.	Wayne.	1,380	9	47.3	+4.4	73	27	19	23	36	4.75	+0.35	2.00	1.0	14	2	11	14	SW
Harrisburg.	Dauphin.	1,340	8	47.6	+4.6	72	18	20	30	31	3.20	+0.64	1.68	.....	16	1	9	20	SW
Hollidaysburg.	Blair.	847	8	45.7	+5.6	75	18	20	10	46	1.73	+0.96	0.61	T	6	12	5	13	W
Honesdale.	Wayne.	1,000	11	47.6	+6.8	73	1	20	30	42	3.40	+0.68	1.85	.....	6	2	8	20	W
Huntingdon.	Huntingdon.	1,350	3	46.8	+5.3	74	26	14	30	37	4.45	+0.76	1.30	T	13	5	10	15	W
Indiana.	Indiana.	1,350	3	46.8	+5.3	74	26	14	30	36	2.84	.....	0.73	.....	13	5	4	21	.....
Irwin.	Westmoreland.	.....	.....	.....	.....	75	26	18	30	36	2.84	.....	0.73	.....	13	5	4	21	.....



Johnstown	1,184	11	45.3	+5.6	62	26	18	20	34	2.70	-0.50	1.20	T	15	8	11	SW
Kennet Square	275	8	43.0	+5.0	76	18	22	23	34	4.33	+0.57	1.43	1.0	11	13	8	11
Laurelton	413	8	43.4	+0.1	72	19	18	30	38					14	8	9	NW
Lawrenceville, a		8	45.3		73	3	19	30	38				T	6	16	8	NW
Lebanon	453	8	40.3	+5.2	73	18	21	23	38	4.76	-1.08	3.43	0.4	10	6	16	9
Le Roy	1,400	7	43.2	+4.6	71	27	17	30	38	2.32	-0.04	1.60	1.05	6	5	7	SW
Levick Haven	460	6	45.2	+4.8	73	18	22	23	30	3.05	-0.08	1.53	T	9	5	13	W
Lincoln	500	8	47.7	+7.1	78	9	22	10	41	3.65	-2.41	3.00		6	5	7	W
Westmoreland	1,420	3	44.0	+6.7	74	37	19	23	30	35	3.10	-0.79	0.74	15	10	5	N
Lycippus	550	6	44.6	+4.8	73	18	19	23	39	6.74	-2.60	3.85		9	10	5	N
Mauch Chunk	117	25	50.4	+6.4	73	27	29	30	26	2.50	-0.71	0.91	2.8	9	10	11	SW
Philadelphia	1,129	5	50.4	+5.8	75	2	29	30	28	3.06	-0.64	1.25	3.6	9	9	10	11
1529 Centennial avenue	943	20	48.5	+6.5	74	26	19	30	34	2.76	-0.30	0.90		11	7	9	14
Pittsburgh	160	8	48.4	+4.6	76	18	24	23	38	4.28	-0.30	1.90	2.0	8	16	4	10
Montgomery	536	21	46.0	+5.6	73	18	19	23	37	4.51	+0.29	1.23	2.0	11	5	13	12
Quakertown														10			SW
Reading, 3	230	8	45.2	+4.4	73	18	22	23	38	2.34	-0.01	1.40	3.5	7	11	10	9
Reynolds																	
Clinton	1,200	4	43.4	+6.6	73	18	16	20	38	2.34	-0.35	0.80		11	2	7	21
Crawford	1,200	4	43.4	+6.6	73	18	16	20	38	2.34	-0.35	0.80		11	2	7	21
Madawana	451	7	46.5	+5.3	77	27	16	10	41	3.47	+0.06	1.82	T	9	8	4	18
Shilling House	1,475	7	42.4		77	27	16	10	43	2.87				6	5	6	SW
Skippack														15	6	9	NW
McKean	1,500	6	41.8	+5.9	71	28	16	10	40	3.41	-0.79	0.70	T	9	7	5	18
Somerset	2,250	8	44.4	+6.2	70	28	15	29	30	3.84	+0.33	1.00	2.0	9	7	9	14
Northampton	339	19	47.2	+3.6	73	28	26	23	34	4.33	-0.80	2.38		7	15	7	8
Wyoming	600	6	45.0	+8.6	71	16	21	21	35	4.16	+1.48	2.73	0.5	7	7	16	SW
Center	1,191	8	40.3	+7.2	71	16	21	39	30	3.11	+0.16	1.43	T	10	3	17	10
Elk					68	26	18	10	33	3.02			2.0	9	2	8	20
St. Mary's														7	14	9	NW
Delaware	190	7	41.6											7	7	14	9
Swarthmore																	
Delawaranda	754	45.1															
Bradford	681	8	44.8	+6.2	70	18	22	10	36	2.75	-0.51	1.31	1.0	12	4	7	19
Fayette																	
Rintondown																	
Warren	1,327	8	45.2														
Wellshboro, * 1																	
West Chester	456	40	46.7	+6.3	74	16	19	30	43	2.64	-1.45	0.72	6.0	12	7	6	17
West Chester, c																	
Chester	1,352	7	43.9	+6.8	74	13	26	16	10	0.82	-2.81	0.36	T	7	10	8	12
Cheney																	
White Haven	1,352	7	43.9	+6.8	74	13	26	30	35	4.17	+4.17	1.67	4.5	11	13	4	13
Luzerne																	
White Barre	576	6	44.5	+6.3	72	18	19	23	38	5.09	-0.40	3.00	T	6	12	6	9
Waverles-Barre																	
Williamport	536	6	44.5	+6.3	72	18	19	23	38	5.09	-0.40	3.00	T	6	12	6	9
Williamport																	
York	385	8	47.6	+5.7	74	18	26	20	37	2.55	-0.12	1.59	T	9	8	13	W

- Extremes of temperature from observed readings of dry thermometers.

1 Mean of 7 A. M. + 2 P. M. + 9 P. M. + 9 P. M. - 4.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers. A roman letter following the name of a station, or placed against the data in the body of the form, indicates the number of days missing from the record. For instance, "n" denotes 14 days missing.

## Maximum and Minimum Temperatures for Pennsylvania, November, 1896.

Stations.	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	66	47	72	57	69	40	57	44	68	43	55	39	61	33	43	31	35	27	43	22
Aqueduct.	66	39	74	37	67	41	63	47	73	38	65	37	65	31	44	35	45	31	47	23
Blooming Grove.	67	51	74	40	67	29	55	45	64	51	57	31	55	21	50	33	33	26	43	20
Brookville.	58	39	60	43	57	45	59	33	63	43	56	29	57	34	43	47	54	31	50	27
Cannonsburg.	72	49	77	43	73	47	73	47	65	38	66	26	66	20	53	36	38	29	46	26
Carlisle.	70	44	76	40	70	29	67	40	60	43	60	24	60	24	48	31	33	23	44	23
Caesandria.	61	43	64	35	67	38	57	55	63	46	50	34	60	24	35	31	33	23	44	23
Center Hall.	62	48	67	31	69	35	56	45	70	53	53	28	65	29	54	34	46	29	44	23
Chambersburg.	68	35	71	31	69	35	56	45	70	53	53	28	65	29	54	34	46	29	44	23
Coatesville.	60	43	77	35	70	38	65	36	67	57	59	40	68	33	50	37	49	31	53	26
Confluence.	68	38	65	33	69	35	70	37	53	50	63	26	54	23	62	39	38	29	53	21
Coopersburg.	69	49	78	43	73	44	63	51	63	59	59	41	72	40	54	39	53	33	54	29
Derry.	65	47	65	38	69	53	69	45	63	45	64	37	59	31	61	33	38	30	35	24
Driftton.	60	39	68	31	61	30	51	34	64	50	50	39	64	23	48	34	43	27	46	23
Dyberry.	63	44	65	37	60	43	60	50	66	57	63	43	60	36	46	39	43	33	49	22
Easton.	63	38	67	30	69	35	60	35	63	46	53	33	60	30	50	34	39	30	43	21
Emporium.	63	46	58	43	69	53	63	54	64	43	46	36	56	36	39	31	35	27	45	27
Erie.	63	44	66	40	68	40	56	53	56	40	54	36	60	30	36	30	20	23	40	20
Gettysburg.	63	44	66	40	68	40	56	53	56	40	54	36	60	30	36	30	20	23	40	20
Grampian.	68	39	68	32	70	38	63	51	65	47	57	37	63	31	53	33	39	30	33	23
Greensboro.	60	40	62	31	65	33	59	44	65	56	56	40	60	29	50	40	46	31	59	23
Halstead.	64	45	71	36	62	47	63	52	67	62	55	43	66	34	44	40	46	31	59	23
Hamburg.	61	44	67	43	63	38	64	47	64	57	57	43	61	33	39	34	41	36	47	23
Hamilton.	63	50	70	46	63	47	61	48	70	49	57	42	66	39	55	38	44	33	47	20
Harrisburg.	63	50	70	46	63	47	61	48	70	49	57	42	66	39	55	38	44	33	47	20
Hollidaysburg.	63	39	75	29	72	23	53	43	63	46	58	37	68	27	53	33	40	27	45	20
Honesdale.	73	36	74	23	71	36	64	43	72	53	60	31	66	30	63	35	41	31	46	23
Huntingdon.	71	54	68	46	64	44	64	42	61	34	53	38	63	31	37	32	34	33	53	23
Indiana.	71	54	68	46	64	44	64	42	61	34	53	38	63	31	37	32	34	33	53	23
Irwin.	75	39	75	42	76	56	63	61	66	39	59	26	68	36	41	33	34	30	46	27
Johnstown.	64	36	66	42	68	41	60	50	64	36	54	24	58	35	39	32	34	30	46	27
Kennett Square.	60	53	72	42	71	41	63	60	63	59	67	40	67	35	67	39	47	32	53	23
Lancaster.	71	54	72	38	72	29	60	43	63	43	63	44	70	46	38	35	43	33	53	23
Lawrenceville.	70	43	72	34	63	29	61	46	67	57	63	40	70	26	66	23	40	20	47	26
Lebanon.	63	43	72	34	63	29	61	46	67	57	63	40	70	26	66	23	40	20	47	26
Le Roy.	64	45	69	40	68	40	58	48	70	56	58	36	63	31	50	34	40	26	44	23
Levittsburg.	64	41	71	32	68	36	56	43	67	43	54	38	63	31	53	33	40	26	44	23

Lock Haven, .....	76	45	77	44	78	48	70	36	82	54	67	40	57	32	66	34	53	29	28	45	55	21
Lybourn, .....	64	51	64	53	68	38	69	54	66	54	35	35	64	38	66	30	38	30	28	45	48	42
Palmdam, .....	64	40	70	31	62	36	60	48	66	54	40	40	58	37	64	38	34	30	30	45	48	26
Philadelphia (a), .....	61	53	73	48	70	48	68	52	67	56	45	45	58	47	65	40	40	35	35	49	52	37
Philadelphia (b), .....	61	51	71	46	72	49	68	52	67	60	45	45	56	45	64	39	40	31	31	49	50	34
Pittsburgh, .....	62	46	73	35	72	43	66	52	68	59	37	43	57	32	62	33	36	32	32	46	40	29
Pottstown, .....	62	41	71	34	65	40	65	44	67	60	40	40	57	37	62	33	40	31	30	45	50	40
Quakertown, .....	62	42	70	34	60	37	60	44	68	54	38	43	57	37	62	37	45	30	30	45	50	23
Renovo, .....	62	43	70	34	60	37	60	44	68	54	38	43	57	37	62	37	45	30	30	45	50	23
Scranton, .....	62	42	69	33	68	40	67	48	69	57	38	43	57	37	62	37	45	30	30	45	50	22
Sellersville, .....	62	42	69	33	68	40	67	48	69	57	38	43	57	37	62	37	45	30	30	45	50	22
Selling Grove, .....	73	35	74	33	70	38	63	42	70	48	46	46	60	37	63	35	44	4	4	4	4	16
Shingle House, .....	73	35	74	33	70	38	63	42	70	48	46	46	60	37	63	35	44	4	4	4	4	16
Skippack, .....	73	35	74	33	70	38	63	42	70	48	46	46	60	37	63	35	44	4	4	4	4	16
Smithport, .....	63	34	67	37	67	37	67	37	67	60	37	43	59	37	67	37	43	35	35	49	49	23
Somerset, .....	63	34	67	37	67	37	67	37	67	60	37	43	59	37	67	37	43	35	35	49	49	23
South Bethlehem, .....	60	40	62	41	66	41	63	43	66	48	48	48	62	41	63	39	36	36	38	48	48	16
South Eaton, .....	61	43	63	41	66	41	63	43	66	48	48	48	62	41	63	39	36	36	38	48	48	16
Southampton, .....	61	43	63	41	66	41	63	43	66	48	48	48	62	41	63	39	36	36	38	48	48	16
State College, .....	63	49	70	41	66	41	63	43	66	48	48	48	62	41	63	39	36	36	38	48	48	16
St. Mary's, .....	58	29	60	38	67	38	58	36	62	51	52	34	41	27	33	33	40	27	25	40	40	18
Swarthmore, .....	63	29	67	31	68	36	59	48	68	53	53	39	41	27	33	33	40	27	25	40	40	18
Towanda, .....	63	29	67	31	68	36	59	48	68	53	53	39	41	27	33	33	40	27	25	40	40	18
Uniontown, .....	67	45	70	37	68	45	63	58	62	46	55	39	47	29	56	34	34	30	30	44	44	22
Warren, .....	72	33	74	33	68	38	60	43	64	48	58	35	47	29	56	34	34	30	30	44	44	22
West Chester, .....	58	53	73	44	65	47	66	51	67	58	59	41	65	40	64	39	39	36	36	49	49	29
Westtown, .....	58	49	70	39	64	43	68	50	67	58	62	41	63	36	63	38	43	32	32	49	49	29
White Haven, .....	60	39	67	3	61	36	63	51	66	63	61	39	63	31	63	34	34	30	30	45	45	22
Wilkes-Barre, .....	62	40	69	34	60	37	61	48	71	58	66	40	64	31	63	34	34	30	30	45	45	22
Williamsport, .....	63	43	70	35	65	40	60	50	68	53	56	40	64	33	63	35	45	35	35	45	45	25
York, .....	50	43	72	35	69	4	63	51	71	59	59	40	64	33	63	35	45	35	35	45	45	25

*Maximum and Minimum Temperatures for Pennsylvania, November, 1896.—Continued.*

Stations.	11.		12.		13.		14.		15.		16.		17.		18.		19.		20.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
Altoona.	57	40	49	33	37	29	38	28	50	36	70	48	64	54	73	51	65	31	56	22
Armstrong.	48	35	46	30	42	24	42	28	56	36	69	49	76	60	75	48	65	31	56	22
Beaumont.	50	34	54	33	45	26	45	28	56	36	70	48	76	60	75	48	65	31	56	22
Brookville.	52	40	54	33	45	26	45	28	56	36	70	48	76	60	75	48	65	31	56	22
Camdenburg.	53	46	56	38	47	29	47	31	60	40	73	51	80	64	79	54	72	33	62	44
Carlisle.	54	48	57	40	49	31	49	33	64	44	77	57	84	68	81	61	76	35	64	46
Casport.	56	41	59	41	52	32	52	35	68	48	81	61	88	72	91	75	86	38	67	49
Center Hall.	51	38	51	40	45	27	42	28	56	36	70	48	76	60	75	48	65	31	56	22
Chambersburg.	57	42	54	34	44	26	44	28	56	36	70	48	76	60	75	48	65	31	56	22
Chambersburg.	57	42	54	34	44	26	44	28	56	36	70	48	76	60	75	48	65	31	56	22
Coalport.	54	44	56	38	47	29	47	31	60	40	73	51	80	64	79	54	72	33	62	44
Coopersburg.	56	41	59	41	52	32	52	35	68	48	81	61	88	72	91	75	86	38	67	49
Drifton.	52	39	57	42	47	28	47	31	60	40	73	51	80	64	79	54	72	33	62	44
Deberry.	50	36	45	35	38	30	37	27	48	38	53	43	61	51	63	53	43	38	35	23
Easton.	53	49	53	39	47	30	37	27	48	38	53	43	61	51	63	53	43	38	35	23
Emporium.	54	39	48	33	47	30	37	27	48	38	53	43	61	51	63	53	43	38	35	23
Erie.	53	41	44	39	36	32	36	30	56	36	64	52	63	57	70	56	37	31	32	27
Gettysburg.	52	49	53	38	36	28	34	24	52	38	62	43	64	59	68	59	33	33	33	29
Greensburg.	56	43	56	39	40	19	40	19	62	26	67	34	70	29	71	46	54	35	44	30
Halsburg.	51	40	46	33	40	30	33	22	52	31	63	31	65	40	69	46	63	39	30	22
Hollidaysburg.	51	44	51	43	44	32	43	30	46	26	62	31	73	37	73	48	63	37	43	30
Homer.	50	52	45	41	44	31	36	25	45	25	60	40	64	53	67	55	66	30	47	33
Huntingdon.	52	41	51	40	43	34	41	34	48	31	63	37	69	44	73	63	36	40	30	29
Huntingdon.	57	41	49	31	41	28	40	28	60	22	72	46	65	48	75	43	66	33	33	29
Huntingdon.	52	42	62	45	45	28	41	31	61	43	61	33	69	41	75	44	67	44	46	31
Indiana.	66	53	56	31	34	25	43	29	66	36	63	53	68	56	70	41	48	39	39	29
Irwin.	56	43	50	35	36	29	47	45	59	46	63	54	69	67	69	46	53	33	47	37
Jonestown.	55	46	57	47	33	34	25	40	26	44	34	66	46	54	66	50	63	38	41	36
Kennett Square.	54	37	60	43	48	33	43	29	54	27	69	35	75	40	76	51	63	41	46	30
Lancaster.	72	42	72	54	68	40	64	34	72	56	70	36	73	43	78	44	64	38	40	29
Lawrenceville.	62	32	54	35	46	31	42	27	52	26	63	38	63	48	68	44	66	30	33	21
Lebanon.	53	39	50	37	45	31	41	30	47	25	63	30	72	35	73	40	62	40	40	29
Le Roy.	50	39	46	36	38	30	33	23	56	30	61	40	66	52	70	50	60	30	30	17
Lewistown.	51	39	47	35	41	32	43	28	54	28	66	39	71	37	73	45	63	32	45	28

Lock Haven.	52	33	49	39	46	32	43	29	60	24	72	31	70	40	75	50	69	41	59	23
Lycippus.	57	41	56	42	50	31	38	30	42	22	58	46	64	53	69	53	69	43	46	27
Mauch Chunk.	53	40	50	37	46	30	37	34	54	34	68	29	72	46	73	50	73	38	40	27
Philadelphia (a).	59	43	57	47	52	36	45	33	54	34	66	48	70	46	73	56	73	37	41	32
Philadelphia (b).	57	43	57	47	52	36	45	33	54	34	66	48	70	46	73	56	73	38	41	32
Pittsburgh.	56	49	50	37	46	30	37	34	54	34	66	48	70	46	73	56	73	38	41	32
Pottstown.	50	38	52	44	46	34	42	32	56	37	69	52	72	59	71	59	76	31	42	30
Quakertown.	56	38	52	44	46	34	42	32	56	37	69	52	72	59	71	59	76	31	42	30
Renovo.	55	38	43	39	39	30	39	26	52	24	67	31	71	41	73	49	63	42	43	27
Scranton.	53	35	48	30	43	25	41	29	52	25	64	44	64	52	78	46	60	30	35	21
Selling Grove.	51	35	54	37	42	30	42	32	45	27	69	31	68	40	72	50	65	29	39	25
Shingle House.	54	36	58	30	51	27	42	24	55	28	65	40	74	35	76	40	64	35	50	28
Slipshack.	59	35	53	35	49	31	53	26	50	24	70	41	71	35	75	34	63	32	38	30
Smithport.	52	43	48	36	40	30	35	26	54	26	63	42	61	47	69	46	63	35	33	30
Somerset.	52	43	48	36	40	30	35	26	54	26	63	42	61	47	69	46	63	35	33	30
South Bethlehem.	54	40	56	43	46	33	45	23	50	24	64	35	71	41	72	53	66	38	40	31
South Easton.	52	40	50	35	46	33	45	23	50	24	64	35	71	41	72	53	66	38	40	31
State College.	54	35	49	39	39	29	36	28	53	28	68	47	65	54	71	51	62	34	34	30
St. Mary's.	51	31	44	36	35	27	36	24	48	23	60	28	64	40	65	51	61	27	24	23
Swarthmore.	51	41	50	38	44	32	36	28	55	27	66	34	68	44	70	46	66	33	34	23
Towanda.	53	43	49	39	39	29	36	28	55	27	66	34	68	44	70	46	66	33	34	23
Uniontown.	53	43	49	39	39	29	36	28	55	27	66	34	68	44	70	46	66	33	34	23
Warren.	59	37	43	36	53	26	33	26	63	39	74	50	69	53	68	47	66	31	32	24
West Chester.	57	39	50	44	47	34	40	31	53	30	68	41	71	43	74	54	66	39	49	30
Westtown.	58	26	54	46	47	33	40	29	53	28	64	38	71	43	70	51	65	31	35	24
White Haven.	52	38	46	27	41	29	33	26	51	25	67	29	66	35	73	50	67	35	39	26
Wilkes-Barre.	54	30	52	38	47	31	46	30	50	25	64	31	68	39	72	50	67	35	34	26
Williamsport.	52	43	46	39	41	33	40	29	47	27	68	33	67	38	73	48	63	34	35	30
York.	57	40	53	43	47	31	40	27	60	26	68	33	71	38	74	48	63	42	45	30

## Maximum and Minimum Temperatures for Pennsylvania, November, 1886.—Continued.

Stations.	21.		22.		23.		24.		25.		26.		27.		28.		29.		30.		Monthly Mean.
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	
Altoona.	51	32	50	27	40	23	51	38	57	49	70	44	58	49	61	38	38	30	30	55.3	35.8
Aqueduct.	40	32	47	25	41	22	52	34	44	34	61	50	60	52	61	40	40	33	33	46.3	36.9
Blooming Grove.	41	21	53	33	36	12	44	30	44	34	61	50	60	52	61	40	40	33	33	46.3	36.9
Brookville.	53	40	53	35	45	31	55	42	52	43	73	53	63	55	60	36	36	27	27	52.3	41.2
Cannonburg.	40	32	47	25	41	22	52	34	44	34	61	50	60	52	61	40	40	33	33	46.3	36.9
Carlisle.	46	32	47	25	41	22	52	34	44	34	61	50	60	52	61	40	40	33	33	46.3	36.9
Cassandria.	46	32	47	25	41	22	52	34	44	34	61	50	60	52	61	40	40	33	33	46.3	36.9
Center Hall.	40	20	41	27	39	25	50	36	47	37	61	46	54	44	54	33	33	24	24	51.5	37.3
Chambersburg.	44	32	39	22	43	19	50	36	47	37	61	46	54	44	54	33	33	24	24	51.5	37.3
Coatesville.	43	32	48	30	48	21	59	37	57	45	70	44	73	57	65	46	46	33	33	57.4	33.9
Confluence.	43	32	48	30	48	21	59	37	57	45	70	44	73	57	65	46	46	33	33	57.4	33.9
Coopersburg.	43	31	44	24	48	24	59	37	57	45	70	44	73	57	65	46	46	33	33	57.4	33.9
Derry.	47	33	60	33	43	31	58	38	56	50	75	55	71	61	71	41	41	33	33	55.6	37.5
Drifton.	39	24	40	29	35	17	53	35	40	30	62	45	70	50	57	35	35	25	25	50.0	31.7
Dyberry.	38	31	42	34	44	24	56	39	53	43	66	44	68	48	66	44	44	32	32	53.8	37.8
Easton.	53	34	47	28	42	16	55	37	55	35	68	45	69	48	65	35	35	27	27	54.8	34.2
Emporium.	44	32	38	15	52	32	51	43	63	39	70	59	69	48	65	35	35	27	27	50.0	38.5
Erie.	44	32	38	15	52	32	51	43	63	39	70	59	69	48	65	35	35	27	27	50.0	38.5
Gettysburg.	48	34	38	26	40	23	53	43	64	40	70	46	63	60	60	33	34	24	24	50.7	35.5
Grampian.	69	38	60	37	58	26	60	48	69	38	74	40	75	58	69	33	35	27	27	57.7	35.6
Greensboro.	41	28	41	27	39	18	55	38	50	36	65	45	69	58	64	36	37	23	23	53.1	33.6
Hallstead.	46	31	45	42	45	32	54	44	55	44	67	46	72	56	62	50	50	30	30	56.1	39.4
Hamburg.	39	25	45	31	38	21	51	35	47	33	67	39	74	57	63	40	40	25	25	52.8	35.9
Harrisburg.	44	32	49	34	45	23	59	40	60	46	74	46	71	61	67	42	42	33	33	56.8	39.5
Holidaysburg.	46	33	48	27	42	23	63	35	60	50	72	40	71	63	63	37	40	23	23	57.2	34.2
Honesdale.	43	34	43	39	42	23	53	37	70	45	72	42	75	58	72	41	44	31	31	54.6	36.7
Huntington.	66	34	63	30	63	42	61	47	71	54	74	63	70	58	72	41	44	31	31	57.0	36.7
Indiana.	62	38	45	40	55	44	59	49	76	47	79	65	68	43	53	25	25	33	33	56.9	41.4
Irwins.	60	40	42	31	52	33	56	50	67	47	69	40	78	60	60	48	49	32	32	53.5	37.1
Jennettown.	45	33	48	32	52	23	69	35	63	40	70	47	72	56	60	48	49	32	32	53.5	37.1
Kennett Square.	46	31	46	32	48	28	63	43	63	43	72	53	74	62	66	30	30	28	28	56.6	41.7
Lancaster.	42	29	45	33	39	19	53	37	57	31	64	50	68	50	61	36	38	29	29	55.6	40.0
Lawrenceville.	39	32	45	31	43	21	58	41	59	43	67	47	73	55	66	45	46	32	32	55.8	36.3
Lebanon.	42	24	35	27	38	23	53	35	54	36	67	47	71	61	61	31	31	23	23	52.1	34.4
Le Roy.	43	32	46	30	40	22	59	38	58	39	61	45	72	53	65	40	48	31	31	55.6	34.7
Lewisburg.	43	32	46	30	40	22	59	38	58	39	61	45	72	53	65	40	48	31	31	55.6	34.7

Look Haven.	42	32	50	39	48	34	48	38	53	37	54	42	70	47	68	42	54	32	29	36	24	53.1	36.1
Lycippus.	50	29	61	35	41	30	41	36	59	50	67	57	74	59	73	38	43	26	29	36	19	53.3	36.4
Mauch Chunk.	35	28	42	35	42	19	39	58	40	53	60	42	68	53	63	41	41	31	33	3	37	54.0	35.2
Philadelphia (a).	48	33	48	36	45	30	63	47	59	46	68	48	72	58	70	46	46	33	33	29	29	53.7	42.2
Philadelphia (b).	46	32	49	36	45	30	63	43	53	46	68	48	74	57	70	48	48	32	33	23	19	53.0	41.9
Pittsburgh.	62	38	43	35	53	34	59	53	71	51	74	57	70	55	51	31	31	23	28	23	23	57.3	39.5
Pottstown.	44	32	46	32	46	24	62	44	58	42	68	48	72	60	66	46	46	32	32	32	26	56.0	39.5
Quakertown.	40	28	46	37	45	19	59	37	56	33	64	41	71	54	65	49	49	33	31	22	22	54.3	34.6
Renovo.	46	32	47	26	41	22	45	37	51	36	68	43	67	55	69	37	36	20	30	16	16	55.0	31.9
Saegertown.	49	29	47	31	50	22	55	41	69	30	70	50	74	54	60	26	36	20	30	29	25	54.8	35.7
Scranton.	41	27	43	33	40	22	58	38	50	40	66	40	71	57	67	39	41	27	29	29	25	54.8	35.7
Selinsgrove.	54	32	63	30	47	28	47	29	60	34	74	40	77	49	67	44	44	35	38	30	30	53.9	34.1
Shingle House.	50	28	38	28	41	17	53	23	54	34	71	43	68	40	52	32	32	23	24	16	16	54.2	30.6
Slipkirk.	44	30	46	43	47	18	45	36	59	35	60	45	73	54	72	50	67	50	34	17	17	50.1	34.2
Smethport.	52	30	34	30	39	20	52	32	59	32	71	51	66	40	40	32	32	23	26	19	19	51.0	32.7
Somerset.	60	32	59	30	40	33	56	38	66	30	70	40	68	40	40	21	25	15	27	20	20	54.7	34.0
South Bethlehem.	38	31	39	34	48	26	56	39	56	36	58	37	70	43	73	61	61	33	34	30	30	56.8	37.7
South Easton.	40	28	43	31	40	22	45	40	53	40	65	49	70	57	67	40	41	29	30	24	24	51.6	35.5
State College.	43	30	47	31	39	26	58	38	64	42	67	44	68	60	65	37	52	28	41	21	21	55.7	36.9
St. Mary's.	54	34	39	32	50	21	52	36	63	37	68	46	62	54	54	54	37	24	25	25	18	50.4	32.7
Swarthmore.																							
Towanda.	42	3	44	32	41	22	58	40	64	41	68	50	68	58	66	37	39	27	28	24	24	54.4	35.8
Uniontown.	66	36	44	38	64	35	58	53	70	51	76	56	74	62	62	38	38	30	30	21	21	56.7	40.9
Warren.	43	32	56	33	43	23	53	42	69	43	69	51	67	58	61	33	33	21	25	19	19	56.1	35.4
West Chester.	45	32	36	33	45	27	64	41	59	46	60	48	69	57	66	46	46	30	31	25	25	57.1	40.3
Westtown.	46	32	46	32	44	26	68	31	57	44	66	47	70	56	68	45	45	30	31	25	25	57.1	40.3
White Haven.	38	26	42	32	39	19	53	37	50	35	67	43	68	56	63	36	37	26	31	23	23	53.8	33.4
Wilkes-Barre.	42	28	43	32	42	23	54	39	55	39	67	44	72	59	69	40	40	22	29	32	32	56.8	35.4
Williamsport.	44	30	40	33	41	27	43	40	54	40	63	43	70	47	57	40	40	30	33	25	25	52.8	35.3
York.	46	34	47	32	45	21	65	40	64	43	70	48	73	59	68	46	46	32	38	23	23	57.5	37.3

## Daily Precipitation for Pennsylvania, November, 1896.

Stations.	Day of Month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
<b>Delaware Basin.</b>																
Piethlehem.					2.38			.50			.24	.05	.28			
Blooming Grove.					3.90			.70			.15	.13	.28			
Browers' Lock.					1.85	.03		.19			.15	.23	.23			
Coatsville.				.24	1.56			.30			.18	.26	.01	†		
Coopersburg.				.06	2.65	.02		.51			.20	.05	.01			
Poylertown.				.06	1.72			.34			.21	.10				
Dyberry.					1.46	.15		.63			.20	.10				
Easton.					2.20			.57			.20	.05	†			
Forks of Neehaminy.					2.23			.39	.06		.24	.24				
Frederick.				.06	1.50			.39			.21	.15	.01			
Hamburg.					2.48			.68			.26	.05				
Hamilton.					1.10	.54		1.26	.03		.19	.05	.08	.02		
Ironside.																
Kennett Square.				.12	1.42			.21			.12	.13				
Landis.					1.74			.02			.23	.19				
Marsh Chunk.					3.85	.49		.54			.26	.06				
Mt. Clear.					2.02	.13		.13			.23	.11				
Philadelphia (a).				†	.91			.01			.18	.08	†			
Philadelphia (b).					1.35			.03			.17	.09	†			
Point Pleasant.					1.80			.17			.05	.05				
Pottstown.					1.30			.50			.22	.16				
Quakertown.					2.12	.14		.44			.22	.05	†			
Reading.				.04	2.42			.50			.23	.05				
Seisholtzville.				.07	3.42			.58			.25	.05				
Shawmont.				.01	1.60			.11			.15	.18				
Skippack.																
Smiths' Corner.					2.14	.03		.18			.23	.10				
Swarthmore.						1.70		.18			.19	.08	†			
West Chester.				.22	1.45			.19			.19	.26				
Westtown.				.05	1.41			.20			.14	.13				
White Haven.					3.17			.53			.50	.04	.07	†		
<b>Susquehanna Basin.</b>																
Altoona.				.63	.81						.33	.07	.03			
Aqueduct.				.70	1.30							.11	†			
Carlisle.				.30	1.86			.14			.13	.07	.12			
Centre Hall.			1.35	.25				.10			.40	.08	.56			
Emporium.				.48	.91			.02			.62		.16			
Glirardville.				2.00	3.73			.22			.77	.04	.03			
Grampian.				.50	.87			.01			.60	.05	.05	.03		
Haitstead.				.01	2.00	.01		.06			.21	.04	.08			





## Daily Precipitation for Pennsylvania, November, 1896—Continued.

Delaware Basin.	Day of Month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Bethlehem, .....					.15			†				.36	.02			4.33	
Blooming Grove, .....					.36			†		.03		.80	†			6.49	
Browers' Lock, .....					.11	.13						.17	.33	.39		3.58	
Coatesville, .....					.08	.09						.76	.54	.24		4.25	
Coopersburg, .....					.07			.07		.01		.67	.65	.10		4.87	
Doylestown, .....					†	.33						.76	.28	.28		3.86	
Dyberry, .....					.31				.20			.37	†			3.42	
Easton, .....					.20			†					1.08	.01		4.46	
Forks of Neshaminy, .....					.09	.16				.02		.65	.43	.43		4.85	
Frederick, .....					.08	.10				.02		.60	.40	.22		3.90	
Hamburg, .....					.12			†				1.06				4.11	
Hamilton, .....					.06	.07		.05		.03		.35	.36			4.22	
Honesdale, .....																	
Kennett Square, .....					.06	.32				.03		1.02	.47	.45		4.33	
Lancaster, .....					.09	.15						.53	.61			3.84	
Landisburg, .....					.27			.03				1.15				6.74	
Mechanicstown, .....						.27						.47	.54	.27		4.17	
Ottleville, .....					.06	.17		†				.35	.46	.28		2.51	
Philadelphia (a), .....					.05	.20		†				.47	.47	.23		3.08	
Philadelphia (b), .....					.04	.15						.60	.31	.09		3.37	
Point Pleasant, .....					.20							.30	.50			4.26	
Pottstown, .....					.11	.13		†				.44	.64	.32		4.51	
Quakertown, .....					.05	.06						.70	.35	.05		3.45	
Reading, .....												1.03	.41			5.77	
Scranton, .....												.60	.29	.21		3.43	
Shawmont, .....					.05	.22											
Skipack, .....					.07	.15						.60	.50	.29		4.28	
Smiths' Corner, .....					.05							.96	.31	.30		3.58	
Swarthmore, .....					.09	.19				.02		1.02				4.17	
West Chester, .....					†												
Westtown, .....								†									
White Haven, .....					.11							1.01	.06			5.40	
Susquehanna Basin.																	
Altoona, .....					.49	.02		.02				.34	†			2.80	
Aqueduct, .....							.01					.95	.21			3.47	
Carlisle, .....					.11							.85	.85	.06		3.69	
Centre Hall, .....												.46				3.11	
Emporium, .....					.53	†	†	.31	.09		.36	.07		†		2.60	
Girardville, .....					.04							1.22				3.03	
Grampian, .....					.61			.14			.23	.24				3.26	
Hallstead, .....					.06	.11		.07	.15	†	.10	.24	.01	†		3.28	
Harrisburg, .....					.02			.01				.33	.13	†		3.36	



### Climatology of the Month.

#### Atmospheric Pressure.

The mean pressure for the month, 30.21 inches, is .09 above the normal. At the United States Weather Bureau stations the highest observed was 30.92 inches, at Philadelphia and Harrisburg on the 28th, and the lowest, 29.63 inches, at Philadelphia on the 9th.

#### Temperature.

The means of the daily maximum and minimum temperature, 38.7 degrees and 22.5 degrees respectively, give a monthly mean of 30.6 degrees, which is 2.4 degrees below the normal, and 3.6 degrees below the corresponding month of 1895.

The average daily range was 16.2°.

The highest monthly mean was 35.0°, at Pittsburg.

The lowest monthly mean was 25.0°, at Dyberry.

The highest temperature recorded during the month was 67°, on the 13th at Cannonsburg and Irwin, and 10th at Indiana.

The lowest temperature was minus 13°, on the 28th at Dyberry.

The greatest local monthly range was 69°, at Dyberry.

The least local monthly range was 44°, at Erie.

The greatest daily range was 50°, at Saegerstown.

#### Precipitation.

The average precipitation for the month, 1.20 inches, is 2.12 inches less than the normal.

The largest totals of rainfall, in inches, were: Somerset, 2.62; Oil City, 2.10; Johnstown, 2.04; Saegerstown, 2.01; Shingle House, 2.00; Shawmont, 2.00. The least were: Harrisburg, 0.40; Reading, 0.40; York, 0.45; Chambersburg, 0.48; Easton, 0.49; Kennett Square, 0.56.

Average depth of snow, 5.4 inches.

The largest totals of snowfall, in inches, were: Somerset 13.0; Forks of Neshaminy, 10.0; Saegerstown, 10.0; Swarthmore, 10.0; Quakertown, 9.5; Grampian, 9.0.

#### Wind and Weather.

The prevailing wind was from the west.





Average number of rainy days, 6; clear, 10; partly cloudy, 9; cloudy, 12.

Miscellaneous Phenomena.

Snow.—1, 4, 5, 9, 15, 16, 18, 19, 20, 21, 22, 23, 24; 25.

Aurora.—Coatesville, 2; Hallstead, Hamlington, Quakertown, and State College, 3; Le Roy, 3, 13.

Coronae.—Philadelphia, Centennial Ave., 12, 20.

Solar Halo.—Hallstead, 16; Philadelphia, Centennial Avenue, 1, 5, 12, 29; Somerset, 12; State College, 20; Towanda, 21, 22, 23; York, 19.

Lunar Halo.—Carlisle, 12, 17, 19; Cassandria, 19; Hallstead, 12, 13, 14, 15, 16, 19; Harrisburg, 12, 14, 17, 19; Philadelphia, Centennial Avenue, 12, 19; Philadelphia, Weather Bureau, 12, 13, 19; Somerset, 12, 13; South Bethlehem, 19; State College, 10, 12, 19; Towanda, 12, 13, 15, 17, 19; York, 12, 14, 19.

Meteors.—Philadelphia, Centennial Avenue, 11.

## Climatological Data for Pennsylvania, December, 1896.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Mean.	Temperature, in degrees Fahrenheit.				Precipitation, in inches.				Sky.				Prevailing wind.	direction of
					Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest daily range.	Total snowfall (un-melted).	Number rainy days.	Number clear days.		
Altoona.	Blair.	1,131	8	30.6	-3.5	61	13	3	28	31	1.44	-1.75	0.63	6.5	9	9	10	NW
Aqueduct.	Perry.	367	7	32.5	-1.8	64	13	3	28	31	0.63	-2.32	0.25	2.6	5	6	12	NW
Bloomington Grove.	Pike.	367	8	25.4	-4.8	52	13	7	28	28	1.13	-2.34	0.60	8.0	7	13	6	NW
Brookville.	Jefferson.	935	22	36.8	.....	67	13	7	25	44	1.31	-1.07	1.08	5.6	9	19	0	W
Cannonsburg d.	Washington.	490	8	31.6	-1.8	63	13	8	23	34	0.70	-2.17	0.41	2.4	7	15	6	W
Carlisle.	Cumberland.	2,100	.....	.....	.....	56	13	8	23	33	1.46	.....	0.40	4.0	5	14	12	W
Cassanovia.	Cambria.	.....	.....	.....	.....	58	13	6	23	35	1.63	.....	0.73	4.5	8	4	13	NW
Center Hall.	Centre.	1,000	.....	.....	.....	58	13	6	23	35	0.45	.....	0.18	2.0	5	12	4	W
Chambersburg.	Franklin.	1,390	5	31.0	-2.1	63	13	2	23	36	1.08	-1.56	0.20	4.5	6	13	7	W
Coatesville.	Chester.	390	8	32.0	-1.7	64	13	4	23	36	0.59	-2.92	0.30	4.5	6	19	7	W
Confluence.	Somerset.	20	29.5	.....	.....	60	14	2	23	35	1.08	-1.51	1.01	7.0	10	10	1	W
Coopersburg.	Lehigh.	520	6	34.2	+0.5	65	13	3	23	40	1.04	-3.86	0.47	5.5	5	17	7	SE
Derry Station.	Westmoreland.	.....	32.4	.....	.....	60	13	7	24	29	1.53	.....	0.79	5.0	6	12	6	SE
Drifton.	Luzerne.	.....	.....	.....	.....	56	13	13	23	42	0.91	-2.56	0.44	7.0	7	10	14	NW
Lyberty.	Wayne.	1,100	30	25.0	-2.7	56	13	13	23	37	0.49	-3.28	0.25	5.0	4	5	8	NW
Paston.	Northampton.	325	12	30.1	-2.1	51	13	6	23	27	0.91	-3.28	0.25	5.0	4	5	8	NW
Edinboro*.	Erie.	1,220	7	23.3	0	48	6	10	23	36	1.32	-1.46	1.05	7.2	11	17	8	W
Emporium.	Cameron.	1,050	8	29.4	-2.2	56	13	1	23	36	1.32	-1.46	1.05	7.2	11	17	8	W
Erie.	Erie.	1,400	24	31.7	-2.3	58	12	14	23	21	0.72	-2.23	0.22	10.0	4	19	4	SW
Forks of Nehamny l.	Bucks.	204	7	30.3	-7.0	53	12	14	23	21	0.72	-2.23	0.22	10.0	4	19	4	SW
Gettysburg.	Adams.	6	32.0	+0.9	.....	63	14	4	23	33	0.60	-2.83	0.25	3.5	3	16	10	NW
Gramplan.	Cleaveland.	1,450	31	28.5	-1.1	54	12	5	23	36	1.82	-1.83	1.15	9.0	4	5	13	NW
Greensboro.	Greene.	.....	.....	.....	.....	61	13	5	24	36	1.46	-1.38	0.70	2.0	8	0	16	NW
Hallstead.	Susquehanna.	.....	.....	.....	.....	61	13	5	24	36	1.46	-1.38	0.70	2.0	8	0	16	NW
Harrisburg.	Berks.	280	5	27.0	-1.9	56	13	1	23	37	0.99	-2.04	0.56	5.0	2	8	16	NW
Hamilton.	Wayne.	1,960	7	32.6	-1.4	53	13	2	23	31	1.09	-2.04	0.56	5.0	2	8	16	NW
Harrisburg.	Dauphin.	381	8	33.0	-1.0	53	13	2	23	31	1.09	-2.04	0.56	5.0	2	8	16	NW
Hollidaysburg.	Blair.	947	8	30.6	-3.0	63	13	3	23	33	1.31	-1.97	0.48	6.0	6	8	17	W
Honesdale.	Wayne.	1,000	11	.....	.....	64	13	3	23	37	0.77	-2.36	0.56	2.5	4	6	7	W
Huntingdon.	Huntingdon.	650	8	31.2	-2.6	64	13	3	23	37	0.77	-2.36	0.56	2.5	4	6	7	W
Indiana J.	Indiana.	1,850	8	35.0	.....	67	10	9	3	31	0.80	.....	0.87	.....	5	11	0	SW
Irwin.	Westmoreland.	.....	.....	.....	.....	67	13	13	27	30	1.76	.....	0.75	6.0	7	6	3	SW



1,184	11	32.1	-2.5	63	13	5	26	30	2.61	-1.45	0.83	2.0	9	8	14	SW
412	8	32.5	-2.5	61	7	9	24	24	0.56	-2.48	0.24	9.0	3	15	9	7
412	8	30.6	-5.0	54	6	5	24	24	.....	.....	4.0	.....	.....	11	2	6
1,004	5	27.8	.....	54	13	5	28	28	.....	.....	4.0	.....	.....	11	12	8
453	8	31.0	-3.4	59	13	5	28	28	0.68	-2.68	0.38	3.1	6	10	13	8
1,400	7	25.6	-3.4	55	18	0	24	24	0.79	-2.59	0.30	4.4	6	10	13	8
560	6	29.6	-3.5	62	13	3	24	36	1.42	-1.82	0.45	4.0	4	7	6	13
560	8	32.2	-0.1	63	13	3	24	36	1.43	-1.94	0.35	4.0	5	12	4	15
1,420	3	32.3	-3.0	61	13	8	24	28	1.31	-2.48	0.64	4.8	6	.....	.....	.....
560	6	29.1	-2.2	63	13	5	28	37	1.21	-2.23	0.61	4.6	7	17	3	11
117	25	34.8	-3.4	62	7	12	24	21	1.00	-1.74	0.71	8.7	4	11	12	8
137	5	34.4	-3.5	63	7	10	28	24	0.95	-2.31	0.63	8.5	4	11	12	8
842	28	35.0	-7.0	60	12	11	24	25	1.37	-1.14	0.46	3.2	11	2	15	14
168	8	32.2	-3.2	56	7	5	28	26	0.63	-2.75	0.38	2.5	3	20	2	9
538	21	29.5	-2.0	59	13	5	28	38	0.79	-2.30	0.34	9.5	3	8	13	11
280	8	29.8	-3.9	.....	.....	.....	.....	.....	0.40	-2.54	0.24	.....	4	.....	.....	.....
1,200	4	28.8	0	60	13	5	24	31	0.86	.....	0.59	3.5	5	16	4	11
741	.....	29.5	.....	67	12	10	28	50	2.01	-1.35	0.90	10.0	9	3	7	21
455	7	27.6	-4.8	44	21	2	28	39	0.73	-2.43	0.20	3.0	5	6	9	16
1,475	.....	28.0	.....	62	12	4	28	44	2.00	.....	1.28	6.0	5	0	22	9
1,600	6	28.2	-0.4	57	12	2	28	41	1.13	.....	0.60	5.5	3	12	16	16
2,350	8	28.5	-3.0	50	12	2	28	43	0.85	-2.04	0.65	5.5	9	3	15	5
239	19	31.4	.....	54	12	4	24	30	0.77	-2.60	0.48	4.0	5	9	12	71
660	6	29.3	-3.1	61	12	5	28	32	1.11	-0.83	0.48	5.5	6	15	8	14
1,191	8	30.8	-1.3	60	13	5	28	27	1.04	-1.71	0.41	2.5	5	7	13	9
.....	.....	27.4	.....	53	13	0	24	32	1.76	.....	1.13	6.5	6	12	2	17
190	7	31.6	-3.8	57	7	9	24	35	1.00	-1.41	0.60	10.0	4	5	22	4
764	.....	28.1	.....	60	13	.....	28	38	0.57	.....	0.16	2.0	8	7	14	10
681	8	36.0	-2.3	62	12	10	24	38	1.61	-2.17	0.64	3.0	8	14	8	9
7	29.4	.....	.....	55	14	3	24	33	1.63	-1.88	0.76	7.0	8	9	4	18
1,377	8	29.2	-0.3	65	13	3	24	39	0.95	-3.30	0.50	4.5	4	9	6	16
465	40	32.6	-0.8	58	13	9	24	34	0.59	-3.24	0.63	4.8	6	17	5	9
350	7	28.3	.....	49	31	5	28	27	0.72	.....	0.43	7.2	3	8	3	6
1,260	.....	28.9	.....	53	13	3	28	30	0.92	.....	0.60	5.5	7	5	23	4
575	6	30.4	-1.3	57	13	4	28	30	1.08	-2.97	0.60	4.0	3	11	9	11
580	5	30.2	-0.3	50	13	4	28	23	0.89	-1.46	0.34	3.5	4	14	6	11
886	3	31.6	-3.8	60	13	3	28	30	0.45	-2.52	0.31	3.3	4	18	7	6

### Extremes of temperature from observed readings of dry thermometers.

1 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. 4.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

A roman letter following the name of a station, or placed against the data in the body of the form, indicates the number of days missing from the record; for instance, "n" denotes 14 days missing.



Lycippus.	26	13	23	14	24	13	27	14	42	26	51	47	32	45	50	41	53	36	43	26
Mauch Chunk.	20	17	27	16	31	15	34	9	48	16	49	24	72	24	41	27	48	38	52	43
Philadelphia (a).	31	24	26	21	30	20	38	24	49	31	51	37	60	39	50	39	52	38	55	29
Philadelphia (b).	31	23	28	21	30	19	38	20	49	28	52	36	62	38	47	38	53	41	56	39
Pittsburg.	29	16	29	18	31	17	45	22	52	27	54	39	53	37	54	36	51	39	52	38
Pottstown.	32	20	29	20	33	19	34	16	44	21	56	27	57	30	43	31	50	42	52	35
Quakertown.	31	14	24	17	30	15	33	13	37	18	56	27	57	28	49	38	49	37	52	31
Renova.	26	21	21	17	32	11	33	13	37	22	56	25	46	28	42	38	47	38	46	32
Saegerstown.	25	13	26	12	32	12	34	12	45	23	53	35	49	29	44	34	41	35	49	31
Scranton.	28	10	24	14	27	13	34	10	43	21	51	31	52	27	39	32	49	37	51	21
Selinsgrove.	20	12	22	10	27	8	42	12	29	10	27	12	28	20	38	30	40	29	43	23
Shingle House.	21	14	21	12	26	0	34	10	46	26	54	40	47	25	44	23	31	27	54	22
Stippack.	21	18	24	16	24	14	35	8	43	19	58	38	48	23	43	23	33	29	48	22
Stumpart.	22	16	24	14	24	9	33	12	45	25	52	32	44	24	40	32	42	33	50	23
Somerset.	25	26	31	19	24	16	36	17	45	24	51	32	42	27	43	29	47	36	50	40
South Bethlehem.	25	26	31	19	24	16	36	17	45	24	51	32	42	27	43	29	47	36	50	40
South Easton.	20	17	30	14	28	11	30	13	43	26	45	26	46	31	43	27	36	51	40	37
Stroudsburg.	22	17	30	14	28	11	30	13	43	26	45	26	46	31	43	27	36	51	40	37
Stroudsburg, Pa.	22	17	30	14	28	11	30	13	43	26	45	26	46	31	43	27	36	51	40	37
Swatara.	22	15	23	13	25	7	39	7	47	27	45	26	46	31	43	27	36	51	40	37
Swatara, Pa.	22	15	23	13	25	7	39	7	47	27	45	26	46	31	43	27	36	51	40	37
Towanda.	20	18	26	20	28	14	39	15	48	23	52	33	44	29	43	32	47	40	53	39
Uniontown.	26	19	27	17	31	16	43	16	51	25	53	39	51	37	53	39	47	40	53	39
Warren.	27	16	26	17	31	16	43	16	51	25	53	39	51	37	53	39	47	40	53	39
Wellsville.	24	16	24	15	24	8	32	13	38	27	55	35	52	38	43	34	17	32	42	31
Wellsville, Pa.	26	16	24	13	35	6	34	9	41	21	60	30	54	33	45	32	42	34	33	31
West Chester.	30	16	27	18	29	17	35	15	46	21	57	33	57	37	47	16	50	41	53	37
Westtown.	27	17	23	13	25	12	33	8	44	15	52	35	42	26	42	29	48	38	46	35
White Haven.	31	20	28	16	28	15	35	14	46	21	53	27	47	27	45	39	59	38	50	36
Wilkesbarre.	27	17	23	13	25	12	33	8	44	15	52	35	42	26	42	29	48	38	46	35
Williamsport.	29	15	23	13	25	12	33	8	44	15	52	35	42	26	42	29	48	38	46	35
York.	29	15	23	13	25	12	33	8	44	15	52	35	42	26	42	29	48	38	46	35

*Maximum and Minimum Temperatures for Pennsylvania, December, 1896.—Continued.*

Stations.	11.		12.		13.		14.		15.		16.		17.		18.		19.		20.	
	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.
Altoona, .....	49	32	51	27	61	27	48	28	37	30	37	37	44	20	39	29	36	25	23	15
Aqueduct, .....	52	42	47	27	64	33	46	30	40	40	38	38	42	28	33	33	38	31	36	13
Bloomington, .....	40	30	49	26	53	29	61	28	31	15	27	20	33	5	33	23	30	17	26	16
Brookville, .....																				
Cannonsburg, .....	54	33	49	25	67	34	58	28	46	36	53	28	63	21	48	20	43	26	42	24
Carlisle, .....	39	31	49	25	63	29	49	30	37	33	37	31	40	25	40	27	40	27	35	17
Cassandria, .....	39	36	52	30	56	30	50	30	36	33	32	28	40	16	40	35	37	23	26	18
Center Hall, .....	47	36	53	29	58	34	56	31	38	29	33	25	37	21	34	29	36	25	30	16
Chambersburg, .....	52	29	42	23	63	29	55	29	41	29	41	29	39	43	20	38	24	42	36	16
Coatesville, .....	49	32	53	24	64	30	49	35	35	28	37	25	49	24	40	22	43	28	41	13
Confluence, .....	52	40	46	28	56	32	60	31	49	34	40	29	31	15	43	15	40	23	29	19
Coopersburg, .....	52	34	57	30	65	36	58	33	23	26	29	27	52	21	42	21	41	27	43	21
Derry Station, .....	50	29	42	34	60	39	60	31	51	34	41	30	31	18	44	21	42	24	30	21
Drifton, .....																				
Dyberry, .....	38	29	52	23	66	24	38	32	32	19	23	20	36	15	24	23	25	19	31	17
Easton, .....	46	34	47	27	51	30	48	26	35	23	36	24	40	21	39	21	37	27	33	30
Emporium, .....	46	30	54	29	56	27	42	26	38	28	32	21	40	15	38	26	34	24	29	16
Erie, .....	42	38	58	43	63	37	37	28	33	26	29	24	37	19	39	31	30	27	27	23
Gettysburg, .....	58	42	47	31	43	32	63	38	54	32	35	31	42	26	41	25	42	28	27	19
Greensburg, .....	42	32	48	32	54	40	33	28	34	30	33	23	32	14	34	30	30	22	26	18
Grampian, .....	45	25	59	35	61	34	59	33	49	33	38	28	39	16	34	27	29	26	34	17
Hallstead, .....	39	32	50	27	58	32	45	26	36	26	27	23	29	26	36	25	34	28	34	17
Harrisburg, .....	47	42	50	27	58	30	47	26	36	27	23	23	29	26	34	24	34	28	31	20
Hamilton, .....	40	34	51	31	53	37	43	29	30	11	24	21	40	29	41	30	30	20	23	13
Harrisburg, .....	51	35	63	34	63	36	53	36	26	23	39	26	41	18	40	29	38	30	30	16
Holidaysburg, .....	51	29	50	24	63	27	52	26	28	23	39	26	41	18	40	29	38	30	30	16
Honesdale, .....																				
Huntingdon, .....	53	33	47	25	64	37	59	27	41	31	44	30	48	18	38	26	43	29	33	17
Indiana, .....	44	33	47	27	51	31	53	26	43	31	44	30	48	18	38	26	43	29	33	17
Johnstown, .....	44	33	47	27	51	31	53	26	43	31	44	30	48	18	38	26	43	29	33	17
York, .....	50	39	59	30	63	30	48	26	43	34	35	24	48	18	38	26	43	29	33	17
Kanawha Square, .....	51	34	50	27	60	31	51	26	39	29	29	24	42	24	40	26	33	21	34	17
Lancaster, .....	49	35	52	26	48	37	49	28	38	28	34	21	42	24	40	26	33	21	34	17
Lewistown, .....	42	35	48	24	54	32	49	23	32	19	29	19	33	11	36	26	36	20	31	20
Lebanon, .....	49	27	40	20	55	31	48	23	26	20	34	29	43	22	32	25	39	26	33	17
Le Roy, .....	41	21	40	20	55	32	48	23	26	20	34	29	43	22	32	25	39	26	33	17
Lebanon, .....	46	34	46	27	53	29	46	26	37	27	34	26	41	23	40	26	40	27	37	23
Lewistown, .....	46	34	46	27	53	29	46	26	37	27	34	26	41	23	40	26	40	27	37	23
Lock Haven, .....	47	27	43	28	53	28	54	26	43	29	40	27	48	17	40	26	40	27	37	23

Lycippus, .....	50	36	49	25	61	45	53	30	49	32	33	23	30	17	45	18	41	22	30	20
Manch Chunk, .....	45	34	54	22	63	27	46	36	35	25	29	28	41	22	36	19	35	25	35	15
Philadelphia (a), .....	48	41	49	25	57	43	51	38	35	30	33	24	41	26	41	26	38	30	36	36
Philadelphia (b), .....	49	40	40	34	57	41	50	33	43	30	32	24	40	23	29	26	40	30	37	24
Pittsburg, .....	45	39	60	39	60	43	50	36	44	22	34	24	40	23	44	32	39	26	34	22
Pottstown, .....	50	34	50	28	52	34	50	34	34	24	35	27	44	20	37	25	36	29	36	15
Quakertown, .....	46	32	52	24	59	30	49	32	41	24	33	23	44	21	38	27	34	25	38	18
Renovo, .....	47	38	49	33	60	32	41	30	40	23	35	21	40	18	40	24	35	23	29	3
Raegertown, .....	47	35	56	30	57	23	48	30	33	11	31	24	38	13	39	25	35	21	22	20
Sellingrove, .....	44	34	53	26	57	23	43	27	36	10	34	18	36	11	36	27	35	15	40	30
Shingle House, .....	43	37	51	23	62	26	40	24	34	23	32	25	41	13	37	28	40	22	30	14
Skippack, .....	49	39	57	23	57	30	42	24	35	24	32	25	45	11	37	28	39	22	36	16
Smithport, .....	43	30	50	31	47	24	38	22	32	34	32	20	40	15	40	24	32	29	33	21
South Bethlehem, .....	50	37	50	32	50	32	45	32	45	24	32	20	34	15	40	24	32	29	33	21
South Easton, .....	46	36	51	26	61	35	47	32	35	21	31	22	37	19	36	24	30	21	30	17
South College, .....	48	38	51	26	61	35	47	32	35	21	31	22	37	19	36	24	30	21	30	17
St. Mary's, .....	38	32	52	30	53	34	40	25	25	23	32	23	38	15	35	23	29	21	32	14
Swarthmore, .....	47	31	49	33	54	38	43	33	33	26	32	23	40	23	40	24	37	17	37	17
Towansville, .....	42	34	53	27	59	30	49	38	43	36	32	21	37	16	44	23	28	18	34	27
Uniontown, .....	44	34	53	33	57	30	44	38	36	22	39	22	39	13	38	31	37	23	30	13
Warren, .....	47	35	47	31	54	37	45	35	37	26	21	26	45	10	36	30	34	20	35	22
Wellaboro, .....	44	38	50	27	65	30	45	37	38	27	33	24	41	25	38	26	37	28	36	18
West Chester, .....	49	38	50	33	58	38	48	36	39	29	33	24	39	23	38	18	38	26	36	13
Westtown, .....	41	32	52	24	58	34	42	29	37	27	27	23	35	19	33	21	31	23	31	18
White Haven, .....	48	38	53	29	57	29	41	31	35	24	33	23	38	25	37	20	35	24	34	21
Wilkesbarre, .....	44	38	50	30	50	31	42	31	31	40	30	26	42	20	36	29	35	27	32	24
Williamport, .....	43	33	50	26	60	32	49	35	39	32	35	31	39	25	41	25	30	30	39	13
York, .....	43	33	50	26	60	32	49	35	39	32	35	31	39	25	41	25	30	30	39	13

*Maximum and Minimum Temperatures for Pennsylvania, December, 1896.—Continued.*

Stations.	21.		22.		23.		24.		25.		26.		27.		28.		29.		30.		31.		Monthly mean.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.			
Albion.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Aqueduct.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Bloomington.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Brooklyn.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Brownsville.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3
Camden.	32	12	28	21	31	10	27	8	26	12	30	13	31	31	44	33	42	11	44	36	46	30	38.9	32.3

Lock Haven.	34	20	31	10	28	10	31	11	30	2	26	9	41	28	43	33	15	38	41.7	22.8
Lytleburg.	29	24	29	23	23	8	27	13	29	25	33	22	42	22	44	16	44	37	39.0	25.5
Mauch Chunk.	32	14	30	15	30	3	21	7	22	12	32	13	38	3	44	34	47	37	38.4	19.8
Philadelphia (a).	29	29	28	27	27	16	22	12	20	16	36	14	38	5	44	34	52	36	41.3	28.2
Philadelphia (b).	41	25	25	25	25	19	25	24	35	20	33	10	37	22	43	33	57	36	41.4	27.5
Pittsburgh.	34	26	35	26	35	17	21	11	36	15	33	24	45	29	47	39	49	40	42.0	28.0
Pottstown.	38	22	33	23	32	14	22	10	31	15	33	15	36	12	47	33	19	37	39.9	24.5
Quakertown.	38	11	31	18	28	17	21	8	30	7	33	13	37	4	42	28	48	32	39.3	19.7
Reno.	32	29	28	21	28	10	24	5	27	15	33	10	34	12	42	31	51	24	37.7	21.9
Raegertown.	29	16	29	15	26	10	15	7	15	11	30	16	30	12	40	31	42	32	37.4	20.2
Sacramento.	11	25	48	32	40	29	34	17	34	5	31	14	39	6	39	34	41	35	36.9	10.7
Sellins Grove.	44	18	27	17	21	15	23	3	32	2	33	14	33	1	45	34	47	21	38.2	18.9
Shingle House.	39	10	23	13	24	8	22	11	28	18	32	10	36	15	46	28	52	26	40.7	19.6
Smithport.	22	22	22	22	22	13	27	11	31	3	41	2	40	18	40	33	50	30	36.0	20.3
Somerset.	25	20	29	22	31	1	25	20	24	11	30	4	32	13	43	32	46	32	38.5	24.4
South Bethlehem.	31	17	26	16	25	1	23	13	22	14	30	1	37	18	45	32	45	30	38.1	20.3
State College.	31	22	24	21	25	7	22	11	28	14	30	1	39	15	42	33	45	16	36.3	22.7
St. Mary's.	25	17	25	17	25	1	23	13	22	14	30	1	37	18	45	32	45	30	38.1	20.3
Swarthmore.	38	18	26	22	28	11	21	11	28	13	35	9	40	16	40	30	41	34	34.5	20.5
Towanda.	39	10	26	16	25	1	23	13	22	14	30	1	37	18	45	32	45	28	38.5	21.8
Uniontown.	32	24	33	23	31	12	27	11	36	9	32	12	40	16	40	30	41	34	34.5	20.5
Warren.	32	24	33	23	31	12	27	11	36	9	32	12	40	16	40	30	41	34	34.5	20.5
West Chester.	37	23	33	23	31	12	27	11	36	9	32	12	40	16	40	30	41	34	34.5	20.5
Westtown.	35	19	22	20	26	15	19	9	26	12	32	15	37	10	42	32	40	37	33.9	18.5
White Haven.	20	12	28	19	26	15	13	8	24	4	31	4	37	14	41	31	44	29	35.2	18.6
Wilkes-Barre.	45	25	36	18	30	17	17	11	18	15	30	14	33	12	40	28	48	37	36.8	21.4
Williamsport.	33	21	28	22	28	15	24	15	30	14	30	4	33	12	40	28	48	37	36.8	21.4
York.	36	23	33	23	31	17	29	13	33	15	28	3	38	10	47	30	50	34	39.9	21.2

-13 f-10.

*Daily Precipitation for Pennsylvania, December, 1896.*

Stations.	Day of Month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
<b>Delaware Basin.</b>																
Lethichem, .....	†					.43			.33	.06						.02
Blooming Grove, .....				.05				.02	.19							.34
Browers Lock, .....									.14							.30
Coatesville, .....								.02	.47							.30
Coopersburg, .....							†	.02	.90							.31
Doylestown, .....								†	.27							.25
Dyberry, .....				†					.27	.10						.30
Easton, .....								.03	.23							.06
Forks of Neshaminy, .....								.03	.32							.06
Frederick, .....				†				.56								
Hamburg, .....									.44							
Hamlington, .....					.01											
Honesdale, .....									.14							.24
Kennett Square, .....								†								.49
Lansdale, .....								.10	.45							
Mauch Chunk, .....				.01				.11	.31							.63
Ottsville, .....								.01	.12						†	.71
Philadelphia (a), .....							†	.01	.12							.63
Philadelphia (b), .....								.09	.27							.53
Point Pleasant, .....								.09	.27							.10
Pottstown, .....								.23	.38							.34
Quakertown, .....								†	.23							
Reading, .....								.01	.24							
Se-sholtzville, .....								.04	.60							1.30
Shawmont, .....								.14	.16							.60
Skippack, .....								.03	.33							.33
Smiths Corner, .....								.03	.31							.33
Swarthmore, .....								.03	.14							.26
West Chester, .....								.22	.30							
Westtown, .....				.06												
White Haven, .....																
<b>Susquehanna Basin.</b>																
Altoona, .....								.63	.25		.03					
Aqueduct, .....								.15	.10							
Carlisle, .....								.73	.10	.06						
Centre Hall, .....								.73	.23	†						
Emporium, .....	†				†			1.05	.23							
Gettysburg, .....								.25	.20							
Girardville, .....								.35	.20							
Grampian, .....				†				1.15								
Hallstead, .....	.01			†				.47	.35		.06					

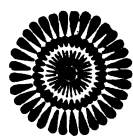




## Daily Precipitation for Pennsylvania, December, 1896—Continued.

Stations.	Day of Month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Delaware Basin.																	
Bethlehem.							.20									0.70	
Blooming Grove.					.10		.60									1.18	
Brothers Luck.							.14									0.89	
Buttsville.						.10										0.59	
Copersburg.						.06	.20									1.04	
Doolstown.							.28									1.07	
Dyersburg.		.03	†			.03	.44		†					.01		0.91	
Easton.						†	.14									0.49	
Forks of Nesquehanna.							.17									0.72	
Frederick.							.41									0.66	
Hamburg.		†					.17							†		0.97	
Hamilton.			.03			.06	.50									1.09	
Honesdale.																	
Kennett Square.						†	.18									0.56	
Lansdale.							.12									0.75	
Mauch Chunk.		.02			†	.10	.31									1.31	
Ottsville.							.84									1.89	
Philadelphia (a).						†	.16							†		1.00	
Philadelphia (b).		†			†	†	.14							†		0.95	
Point Pleasant.							.36									1.25	
Pottstown.						.15										0.63	
Quakertown.		†				†	.22									0.79	
Reading.						.05	.10									0.40	
Scranton.						.05	.18									0.83	
Shawmont.						.30										2.00	
Shippack.					†	.20								†		1.12	
Smiths Corner.							.15									0.82	
Swarthmore.	.90					•	.20									1.00	
West Chester.						.07	.06							.01		0.59	
Westtown.						.12	.08										
White Haven.		.10			.05											0.32	
Susquehanna Basin.																	
Altoona.		.10				.41	.02									1.44	
Aqueduct.		†			†	.15	.10						.02	.11		0.63	
Carlisle.						•	.40							.05		0.70	
Centre Hall.		.05				.40							.39			1.63	
Emporium.		.12	†	†	†	.42		†						†		1.82	
Gettysburg.						•	.35									0.60	
Girardville.					.12	.36	.06							.11		1.20	
Gramplan.		.15				†	.52									1.82	
Hallstead.		.01	.01		.02	•	.30		.02	.01						0.99	





# INDEX.

	Page.
Actinomycosis, .....	648
Advantages of bacteriology, etc., .....	615
Aineyville, diphtheria at, .....	526
Alabama, progress in, .....	766
Alcohol from a sanitary standpoint, .....	809
Alcoholic drinks, .....	809
Allegheny, report, .....	341
Allentown, report, .....	331
Altoona City Hall nuisance, .....	97
decision on, .....	132
Ambler, inspection, .....	277
Ambler, report, .....	151
American Public Health Association, .....	36-801
American Medical Association, .....	35
Animal diseases and food, .....	803
Animal diseases communicated to man, .....	646
Annual reports of county medical inspectors, .....	115-213
Annual reports of boards, .....	27
Anthrax, .....	647, 603
Antitoxin, .....	541
Antitoxin and diphtheria, .....	622
Antitoxin establishments, .....	206, 208
results, .....	450
Antitoxines and State Boards, .....	800
Antivivisection, .....	81, 86
Appendices, .....	133
Appointments, .....	79
Archbald, report, .....	351
Ardmore, inspection, .....	246, 294
Aspinwall, report, .....	351
Associated health authorities, annual meeting, .....	32
second meeting, .....	552
third meeting, .....	592
Associated health authorities of counties, .....	10
Athens, report, .....	351
Atkinson W. B., inspection at Cornwells, .....	259
inspection at Trevoee, .....	282
inspection at Terwood, .....	183
inspection at Maple Station, .....	294
Atwood, report, .....	351
Auburn, report, .....	351
Avalon, report, .....	351
Avondale, report, .....	352

	Page.
Bacteriology, .....	448, 541
Bacteriology and diphtheria, .....	608
Bacteriological diagnosis, .....	71, 93
Bacteriological examination and strength tests, .....	212
Bacteriological examination of vaccines, .....	156
Bacteriological laboratory, .....	9, 416
Bacteriological report, .....	203
Baker, H. B., vital statistics, .....	797
Ball, F. P., sanitary problems in flooded valleys, .....	703
<b>Bangor, report, .....</b>	<b>352</b>
Banks, W. H., report by, .....	225
Bashore, H. B., appointed, .....	127
Bath, report, .....	352
Beaver Falls, report, .....	352
Bedford, report, .....	352
Beltzhoover, report, .....	353
Bergey, D. H., analysis, .....	21
Bernaldez, F. DeP., typhus, .....	803, 804
Berwick, report, .....	353
Bethlehem, report, .....	353
Bicycle in its sanitary aspect, .....	109
Big Run, report, .....	353
Birdsboro, report, .....	354
Blackwood, W., report by, .....	225
Blairsville, report, .....	354
Blakely, report, .....	354
Blindness, .....	107
Blindness, increase of, .....	5
Blindness, prevention of, .....	856
Bloomfield, report, .....	354
Blossburg, report, .....	354
Boardman, W. H., inspection at Montrose, .....	268
Body disinterment, .....	947
Bolton, B. M., advantages of bacteriology, etc., .....	615
diagnosis of diphtheria by cultures, .....	649
on bacteriology, .....	541
report of, .....	72
Bone boiling, .....	110, 281-283, 284
Bone boiling regulations, .....	844
Boroughs, reports, .....	327
Boyertown, report, .....	354
Braddock, inspection, .....	298
Bradford, report, .....	354
Bridgeport, report, .....	357
Brockwayville, report, .....	357
Brodhead, J. Davis, how to abate a cess pool nuisance, .....	830
Brookville, report, .....	357
Brockville, small-pox at, .....	530
Bucks county, report for, .....	213
Buffalo, sanitation, .....	811
Burgettstown, report, .....	357
Burials at Pine Grove Mills, .....	98
Burials at certain depths, .....	53
Burials improper, ....	91
Burial ground nuisance, .....	276
Burials of dead from contagion, .....	125

	Page.
Burials, regulation for, .....	157
Butler, camp near, .....	199
Butler county, report for, .....	214
Butler, report, .....	357
Butler Water Company, opinion on, .....	513
California sanitary progress in, .....	766
Camp ground inspection, .....	282
Canton water inspection, .....	272
Carbondale, report, .....	357
Carbon county report for, .....	215
Carlisle, inspection, .....	242
Carlisle, report, .....	360
Carlisle water supply, .....	19
Car sanitation, .....	801, 802
Carter, rabies, .....	801
Cary's Bank, inspection, .....	248
Castle Shannon, inspection, .....	251
Catasauqua, report, .....	363
Catawissa, report, .....	363
Cattle diseases, .....	533
Cattle tuberculosis, .....	723
Causes of insanity, .....	606
Cawley, M. F., inspection at Fogelsville, etc., .....	249
inspection at South Bethlehem, .....	232
report by, .....	226
Cerebro-spinal meningitis, .....	17, 49, 60, 434
Cerebro-spinal meningitis, .....	17, 49, 60, 433
Cess pool nuisance to abate, .....	830
Chason, A., blindness, .....	807
Chadwick, B., inspection at Coleville, .....	295
inspection at Foster, .....	239
Chambersburg, report, .....	363
Chemical analysis of water, .....	21, 22
Chester, report, .....	363
Chester township, inspection, .....	267
Chicago vaccine stables, .....	177
Children, contagions of, .....	699
Children, deaths of, .....	413
Circulars, .....	862
Cities, reports of, .....	127
Clarion, report, .....	367
Clarion, inspection, .....	242
Clark, A. C., inspection at Trevorton, .....	260
Clayville, report, .....	317
Claysville, report, .....	367
Cleaning cars, .....	802
Clifton Heights, report, .....	367
Closing of bone boiling establishment, .....	121
Coalmont, report, .....	357
Codman and Shurt'eff vaccine farm, .....	180, 759
Cokeville, report, .....	268
Coleville, inspection, .....	295
Colleges and hygiene teaching, .....	737
Collingdale, report, .....	368
Colorado sanitary progress in, .....	767
Columbia vaccine farm, .....	193

	Page.
Colwyn, report, .....	368
Communicable diseases, .....	13, 55
Complaints, .....	91, 113
Compensation for articles destroyed, .....	119
Complaints attended to by correspondence, .....	495
Compulsory vaccination, .....	27, 566
Conewago, inspection, .....	297
Conferences and conventions, .....	32, 92, 548
Conn, G. P., car sanitation, .....	801, 802
Connecticut sanitary progress in, .....	768
Connellsville, report, .....	368
Conshohocken, report, .....	369
Consumption, .....	721
Consumption, deaths, .....	444
Consumption, decline of, .....	543
Contagion hospitals, .....	586
Cook, R. Y., report of executive committee, .....	134
Cooper, A. M., report of, .....	214
Coplin, W. M. L., appointed, .....	127
report on sewage purification of Reading, .....	304
Correspondence, .....	41, 812, 831
Cornwells, inspection, .....	259
Corry, report, .....	369
County associations, .....	53
County medical inspectors, .....	25
Cows, selection of, .....	709
Cremation of garbage, .....	806
Cremation of the dead, .....	805
Cressona, report, .....	370
Cumberland county, report for, .....	216
Dairy cows, .....	709
Dalbey, A. D., inspection at Hustontown, .....	299
report by, .....	224
Dale, J. Y., hygiene of old age, .....	651
Dallastown, report, .....	370
Dauphin county, report for, .....	218
Davis, N. F. appointed, .....	127
Dawson, C. F., report on vaccine, etc., .....	203
Dayton, report, .....	370
Dead, transportation of, .....	806
Death rate of cities, .....	423
Deaths of physicians in Philadelphia, .....	144
Decline of tubercular consumption, .....	72
Delaware county associated health authorities, .....	12, 120
Delaware county, report for, .....	219
Delaware Water Gap, report, .....	370
Delegates elected, .....	98
Delta, report, .....	370
Dengue, .....	804
Deputies appointed, .....	97, 126
De traction of goods by a board of health, opinion on, .....	825
Dingman, inspection, .....	291
Diphtheria, ..17, 50, 55, 61, 62, 65, 70, 87, 90, 94, 105, 109, 110, 111, 113, 124, 363, 240, 242, 249, 251, 254, 258, 259, 261, 275, 280, 286, 291, 292, 294, 300, 301, 434, 449, 525, 809.	
Diphtheria and animals, .....	648



	Page.
Diphtheria and antitoxin, .....	541
Diphtheria and escape of patient, .....	516
Diphtheria, dead, transportation, .....	546
Diphtheria, serum, .....	661
Diploma from the World's Columbian Exposition, .....	31
Disinfection, .....	525, 588, 858
Distribution of annual report, .....	40
Distribution of circulars and forms, .....	41
District of Columbia vaccine farms, .....	174
Division of western district, .....	54
Dr. Henry McNeal vaccine farm, .....	200
Dr. H. Walker Vaccine Company, .....	203
Dog kennel nuisance, .....	246
Donchue, F. O., cattle tuberculosis, .....	723
Dorranceton, report, .....	370
Downingtown, report, .....	370
Doylestown, report, .....	370
Drainage, .....	60, 61, 89
Drunkenness, a vice, .....	810
Dry Run. inspection, .....	253
Dudley, Pemberton, sanitary needs of Pennsylvania, .....	43
sanitary management of contagions in children, .....	699
the decline of consumption, .....	543
Duncannon, report, .....	370
Dunmore, report, .....	371
Duryea, inspection, .....	256
East Bangor report, .....	371
East Brady report, .....	371
East Greensburg, report, .....	371
East Stroudsburg report, .....	371
Edgewood, report, .....	371
Edwardsville, report, .....	371
Eldred, report, .....	371
Elizabethtown, report, .....	372
Elk county, report for, .....	221
Elkland, report, .....	372
Elliott, report, .....	372
Elmhurst, report, .....	372
Emaus, report, .....	372
Embalming, haste in, .....	118
Emporium, report, .....	372
Ephrata, inspection, .....	110, 287
Ephrata, report, .....	372
Epidemics, .....	525
Epidemics, tables of, .....	147
Epidemics, to prevent, .....	851
Erie county, report for, .....	223
Erie county, diphtheria in, .....	528
Erie, deaths registered in, .....	121
Erie, report, .....	373
Escape from quarantine, .....	69
Esplen, report, .....	373
Establishment of a provincial board at Victoria, .....	831
Executive committee, report, .....	134
Exeter, report, .....	373
Expectoration in public, .....	128

	Page.
Expenses of bacteriological laboratory, .....	98
Extracts from annual reports, .....	341
Factoryville, report, .....	373
Fairchance, report, .....	374
Fairmount, inspection, .....	162
Faith curists, .....	124
Fat rendering, .....	63, 89, 248, 267
Financial report, .....	72
Filthy camps of railroads, .....	112
Filthy tenement houses, .....	90
Finleyville, inspection, .....	252
Finleyville, small-pox at, .....	531
"Five mile limit," .....	604
Fleetwood, report, .....	374
Flick, L. F., control of tuberculosis, .....	639
Flood conditions, .....	667
Flooded valleys problems, .....	703
Flourtown, inspection, .....	254
Fogelsville, inspection, .....	219
Folsom, inspection, .....	261
Fond du Lac, vaccine farm, .....	197
Food inspection, .....	470
Forestry and health, .....	67, 810
Formaldehyde, .....	808
Formento, F., alcohol, .....	809
Forms, .....	862
Forty Fort, report, .....	374
Foster, inspection, .....	239
Fountain Hill, report, .....	374
Frackville, report, .....	374
Franklin county farm vaccine, .....	159
Freeland, report, .....	374
Freemansburg, inspection, .....	253
Freemansburg, report, .....	374
Fulton, John, obstructions in the Susquehanna, .....	673
Fulton county, report for, .....	224
Gable, Isaac C., inspection at Stone Quarry, .....	247
Gallitzin, report, .....	374
Garbage, .....	241
Garbage and refuse, regulation for, .....	844
Garbage cremation, .....	806
Garbage disposal, .....	806
Garbage dumps, .....	112, 297
Garbage dumping, .....	62, 229
Garbage nuisances, .....	50
Garoy, H., report by, .....	231
Gettysburg, report, .....	374
Gilberton, small-pox at, .....	526
Girard college and typhoid fever, .....	14
Girardville, report, .....	375
Glanders, .....	617
Glen Campbell, report, .....	375
Glendon, report, .....	375
Glenfield, report, .....	375
Gordon, report, .....	375
Graham, S., inspection at camp of railroad, Butler, .....	299

	Page.
Graham, S., report of, .....	214
Greensboro, report, .....	375
Greenville, report, .....	375
Groff, G. G., report of committee on preventable diseases and travel, etc., ..	146
Grollemons, J., inspection at, .....	261
Grove City, report, .....	375
Halifax, report, .....	376
Hanover, report, .....	376
Harris, G. F., inspection at Pine Grove Mills, .....	276
Hartman, P. A., inspection at Lykens, .....	301
Hartman, P. A., report, .....	219
Harboro, report, .....	376
Hawley, report, .....	376
Head lights on shifters, .....	123
Health authorities to appraise loss by destruction for sanitation, .....	825
Health and frosts, .....	657
Health, State Boards, conference, .....	718
Hellertown, report, .....	376
Hess, H. N., inspection at Clarion, .....	242
inspection at Grollemons, .....	261
inspection at Fairmount, .....	262
inspection at Leeper, .....	275
Hibberd, J. F., tuberculosis and milk, .....	804
Hog feeding, .....	50
Hog nuisance, .....	278
Holidaysburg, inspection, .....	235
Holidaysburg and sewage, .....	19
Homoeopathic Medical Society of Pennsylvania, .....	37
Hop Bottom, report, .....	376
Horlbeck, H. R., dengue, .....	804
Hospitals for contagion, .....	586
Houtzdale, report, .....	376
How diseases are contracted at school, .....	658
Humanized virus, .....	759
Huntingdon, report, .....	376
Hustontown, inspection, .....	299
Hutton J. C., contagion hospitals, .....	586
Hydrophobia, .....	803
Hygiene, educating the public in, .....	570
Hygiene of old age, .....	651
Hygiene teaching in colleges, .....	737
Illegal registration, .....	31, 81, 85, 98
Illinois, sanitary progress in, .....	771
Illinois vaccine farms, .....	177
Immigrants and small-pox, .....	797
Immunization from diphtheria, .....	460
Improper transportation, .....	546
Indiana, sanitary progress in, .....	774
Infectious diseases, .....	440, 479
Inoculations, protective, .....	808
Inoculations, to make, .....	617
Insanity, causes of, .....	696
Inspection of antitoxin propagation establishments, .....	29
Inspection of vaccine propagating establishments, .....	28, 96
Inspections, .....	60, 88, 108, 235
Iowa, sanitary progress in, .....	782

	Page.
Irregular medical registration, .....	31, 81, 85, 98
Irvona, report, .....	376
Jeannette, report, .....	376
Jenkintown, report, .....	377
Jenner Centennial, .....	29
Jenner vaccine farm, .....	161
Jermyn, report, .....	377
Johnsonburg, report, .....	377
Johnstown, report, .....	377
Juniata county report for, .....	225
Kennedy, J. F., milk infection, .....	802
Kennett Square, inspection, .....	246
Kennett Square, report, .....	381
Kennett Square, water pollution .....	18
Keystone Veterinary Medical Association, .....	37
Kibler, C. B., report by, .....	223
Kingston, report, .....	381
Knapp, C. P., inspection at Duryea, .....	256
inspection at Plymouth, .....	268
report by, .....	228
Knoxville, inspection, .....	247
Knoxville, small-pox at, .....	532
Kutztown, inspection, .....	266, 276
Kutztown, report, .....	381
Laboratory of hygiene, .....	81, 85
Lancaster county, report for, .....	225, 382
Lancaster county vaccine farms, ..	168, 756
Lanesboro, report, .....	382
Lansdowne, report, .....	382
Langford, report, .....	383
LaPorte, report, .....	383
Lebanon, report, .....	383
Lee, Benjamin, report of committee on vital statistics, etc., .....	134
inspection of water shed of Mansfield, .....	263
inspection at Ephrata, .....	287
proper use of disinfectants, .....	558
obstructions in the Susquehanna, .....	685
quick or the dead, .....	805
Leeper, inspection near, .....	275
Leffmann, Henry, on typhoid fever in Girard College, .....	16
Legal opinions and decisions, .....	37, 67, 812, 813
Legislation for State Boards, .....	733
Lehigh county, report for, .....	226
Lehighton, report, .....	388
Leiperville, inspection, .....	241
Lewisburg, report, .....	388
Liability of municipal authorities to provide for persons quarantined, ....	39
Liberty, report, .....	389
Library, additions to, .....	41, 896
Liceaga, nomenclature, .....	803, 804
Lindsley, C. A., antitoxines and State Boards, .....	800
contagion of venereal in cars, .....	802
Linesville, report, .....	388
Linwood, inspection, .....	250
Lippert, M. G., educating the public in hygiene, .....	570
milk, etc., .....	631

	Page.
List of local boards of health, .....	883
Littitz, report, .....	389
Little Meadows, report, .....	389
Littlestown, report, .....	389
Logan, C. S., report by, .....	223
Longaker, Daniel, inspection at Kutztown, .....	266, 276
Luzerne county, report for, .....	228
Luzerne, report, .....	339
Lyman, milk tuberculosis, .....	804
Lykens, inspection, .....	301
Lykens, report, .....	389
Malls and specimens, .....	799
Maison, R. S., report by, .....	218
inspection at Leipserville, .....	241
inspection at Cary's Bank, .....	248
inspection at Linwood, .....	250
inspection at Folsom, .....	261
inspection at Morton, .....	263
inspection at Chester township, .....	267
inspection at Valley Forge, .....	267
inspection at Morton, .....	280
inspection at Trainer, .....	285, 286
inspection at Ardmore, .....	240, 294
inspection at Wallingford, .....	296
Maltby, small-pox at, .....	529, 530, 531, 532, 533, 534, 536, 537
Mansfield, water pollution, .....	18
Mansfield, water shed inspection, .....	263
Manure pile, .....	61, 241
Maple Station, inspection, .....	284
Marietta, report, .....	389
Martin, F. C., vaccine farm, .....	183
Maryland, sanitary progress in, .....	776
Massachusetts, vaccine farms, .....	180
Massey, Isaac, inspection at Kennett Square, .....	246
inspection at Tredyffrin, inspection, .....	281
Matson, E. G. bacteriologist, .....	54
exposed water supplies and typhoid, .....	576
Matthews, W. E., inspection at Hollidaysburg, .....	235
Mayfield, report, .....	389
Mayo, E. A., argument on a municipality, .....	827
McDonald, report, .....	394
McFarland, Jos., antitoxin and diphtheria, .....	622
diphtheria serum, .....	661
McIntire, C., communicable diseases, .....	559
McKeesport, report, .....	394
McKillop veterinary school report, .....	210
Meadville, report, .....	390
Measles, .....	586
Media, report, .....	392
Medico-climate congress, .....	551
Medical education and hygiene, .....	740
Medical registration, .....	31
Medical Society of the State of Pennsylvania, .....	34
Members of State Quarantine Board, .....	503
Mercer, report, .....	392
Meshoppen, report, .....	392

	Page.
Pittfield, R. L., appointed, .....	71
bacteriology and diphtheria, .....	608
at Carlisle, .....	242
report, .....	94, 120, 303
inspection at Canton, .....	272
report on vaccine farms, etc., .....	153
Pittsburg, report, .....	433
Pittsburg, typhoid fever in, .....	19
Placarding houses, .....	856
Pleasantville, report, .....	462
Plum, H. A., report by, .....	234
Plymouth, inspection, .....	258
Plymouth, report, .....	462
Plymouth, typhoid fever in, .....	81, 103
Plymouth Water Company, .....	84, 98
Point Marion, report, .....	462
Poison from snow bal's, .....	97
Pollution by culm banks, opinion on, .....	83
Pollution of streams, .....	18, 60, 61, 62, 66, 67, 89, 277
Port Carbon, report, .....	462
Pottstown, report, .....	462
Powers for State Boards, .....	733
Practitioners of medicine, register in Philadelphia, .....	136
Precautionary and hygienic circulars, .....	42
President elected, .....	96
Priceville, small pox at, .....	528
Private pay hospital for contagion, .....	72, 82, 85, 514
Probst, C. O., dead, transportation of the, .....	806
Proper step to take to abate cess pool nuisance, .....	38
Prophylaxis of typhoid, .....	808
Provincial board of health established, .....	69
Public baths, .....	810
"Public Health," journal, .....	30
"Public Health," report on, .....	77
Public instruction and contagious disease, .....	810
"Public streams," opinion on, .....	38, 119, 826
Pure milk, .....	803
Purification of sewage of Reading, .....	304, 307
Quarantine, escape from, .....	516
Quarantine, home and school, .....	856
Quarterly journal of sanitation, .....	30
Quebec, sanitary progress in, .....	789
Quick or the dead, .....	805, 806
Rabies, .....	647
Railway precautions, .....	128
Rates for bacteriological diagnosis, .....	128
Reading, report, .....	462
Reading, sewage purification, .....	304, 307
Reed, bacteria in vaccine, .....	764
Registration, etc., committee report, .....	134
Registration of medical practitioners, .....	113
Regulations of school houses, .....	832
Regulations of the State Board, .....	843
Renovo, report, .....	468
Reports of cities and boroughs, .....	327
Reprints from annual report, .....	42

	Page.
Resignations, .....	80, 126
Reynoldtown, report, .....	469
Richards, Ellen H., schools and municipal responsibility, .....	804
Richter, A., how to secure healthful milk, .....	709
Rickets from sterilized milk, .....	803
Ridgway, report, .....	469
Ridley Park, report, .....	469
Right to enter private places, .....	68
Rinehart, S. M., inspection at Knoxville, .....	247
inspection at Castle Shannon, .....	251
inspection at Wall, .....	289
inspection at Braddock, .....	298
River conservancy boards, .....	808
Riverside, report, .....	469
Rose Valley, inspection, .....	277
Rothrock, J. T., relations of forests to public health and prosperity, .....	687
Roxbury, inspection, .....	300
Rules for propagation of vaccine, .....	765
Rules of quarantine board, .....	602
Salladasburg, report, .....	470
Salmon, D. E., animal diseases and animal food, .....	803
Salt water cases, opinion on, .....	39, 813
Salt water in streams, .....	39, 67, 813
Sanitation in insane hospitals, .....	809
Sanitation Journal, .....	30
Sanitation victory, .....	25
Sanitary convention, ninth, .....	33
Sanitary management of contagions in children, .....	699
Sanitary needs of Pennsylvania, .....	119
Sanitary problems in floods, .....	703
Sanitary treatment of communicable diseases, .....	559
Saw mills, nuisance, .....	231
Sayre, report, .....	470
Scarlet fever, .....	15, 57, 63, 64, 87, 107, 232, 250, 253, 260, 263, 435
Schneider, L., how diseases are contracted at school, .....	658
School children, vaccination, .....	27
School houses, regulations, .....	70, 832
Schuylkill river, sources of pollution, .....	313, 91, 93, 99, 271
Scottdale, report, .....	470
Scott, J. B., inspection at Coleville, .....	297
Scott, W. J., the State and vaccine virus, .....	742
Scranton, report, .....	470
Secretary's report, .....	3
Separator milk, .....	429
Serum test for typhoid, .....	808
Sewage, .....	110, 289
Sewage wanted, .....	268
Sewage of Altoona, .....	18
Sewage of Reading, .....	304
Sewerage, .....	432
Shakspeare, E. O., milk sale, etc., .....	627
Shifters, head lights on, .....	123
Shiremanstown, report, .....	480
Sibbet, R. L., illness, .....	127
report of medical registration, .....	216
Sick room, disinfection, .....	858

	Page.
Singular contagion of scarlet fever, .....	232
Size of class rooms, .....	831
Slaughter house nuisance, .....	295
Slee, Richard, appointed, .....	127
Small-pox, .....13, 55, 62, 247, 252, 415, 435,	529
and immigrants, .....	797
epidemics, .....	526
in Mexico, .....	811
in Pennsylvania, .....	49
Snyder county, report for, .....	230
Snyder, G. D., flood conditions, .....	667
Soiled clothing destroyed, .....	525
Somerset county, report for, .....	231
South Bethlehem, inspection, .....	292
report, .....	450
South Chester, report, .....	482
South Fork, report, .....	482
South Greensburg, report, .....	482
Specifications for work at quarantine pier, .....	511
Sprague vs. Baldwin, et al., .....	822
Spring City, report, .....	482
Spring Grove, report, .....	482
St. Clair, report, .....	483
Standing committees, reports, .....	133
State Boards and local boards, .....	800
State Boards conference, .....	751
State and vaccine virus, .....	742
State laboratory of hygiene, .....	12
State lunatic hospital and typhoid fever, .....	19
State Quarantine Board, report, .....	498
State Sanitary Convention, 1897, .....	127
Steamboat sanitation, .....	802
Steamship, small-pox on, .....	535
Steelton, report, .....	483
Sterilization of milk and scurvy, .....	803
Stillborn, meaning of, .....	804
Stoneboro, report, .....	483
Stone Quarry, York county, inspection, .....	247
Strasburg, report, .....	483
Stream pollution, ..... 18, 60, 61, 62, 66, 67, 89,	277
Subscription for section on State medicine, A. M. A., .....	99
Sulphur fumigation, .....	860
Sunbury, report, .....	483
Susquehanna, flood conditions, .....	667
obstructions, .....	678
report, .....	485
Swarthmore, report, .....	485
Swarts, G. T., potable water for cities, .....	798
pure milk, .....	803
Tabular abstract of reports of cities and boroughs, .....	328
Tamaqua, report, .....	485
Taylor, report, .....	485
Tennessee Centennial and Exposition, .....	31
Terwood, inspection, .....	283
Third annual meeting of the State Associated Health authorities, .....	32
Thompsontown, report, .....	485



	Page.
Throop, report, .....	485
Tidioute, report, .....	485
Tioga county, report for, .....	233
Titusville, report, .....	486
Topton, report, .....	486
Trainer, inspection, .....	285, 286
Transportation of dead body, .....	848
Transportation of diseased tissue by mail, .....	810
Travel, etc., sanitation of, .....	846
Tredyffrin, inspection, .....	281
Trevorton, inspection, .....	260
Trevose, inspection, .....	282
Troy township, inspection, .....	278
Tuberculin test in cattle, .....	71, 538
Tuberculosis, cattle, .....	723
Tuberculosis, control of, .....	639
Tuberculosis of animals, .....	647
Tullytown, report, .....	486
Tunkhannock, report, .....	486
Tweedle, J. B., report of, .....	215
Twenty-fourth meeting of the American Public Health Authorities, ....	801
Typhoid fever, 13, 59, 64, 66, 71, 87, 103, 107, 112, 231, 232, 258, 262, 299, 300, 422, 435, 808 and malarial, .....	707
in boroughs in drainage area of Allegheny river, .....	121
Typhus fever, .....	801, 804
Tyrone, report, .....	486
Upland, report, .....	486
Vaccination, compulsory, .....	27
Vaccination compulsory, opinion on, .....	821
Vaccination, public, .....	413
Vaccine farms, etc., report on, .....	29, 99, 153, 168, 106
Vaccine virus and the State, .....	742
Valley Forge, inspection, .....	267
Veale, M., compulsory vaccination, .....	566
Venereal and cars, .....	802
Vessels examined, .....	501
Veterinarian, .....	128
Victoria health board, .....	831
Victory for sanitation, .....	25
Violation of rules in transit of bodies, .....	70
Vital statistics, .....	790
Vivisection, .....	635, 717
Wagenseller, F. J., report by, .....	230
Wallingford, inspection, .....	196
Washington, report, .....	486
Wall, inspection, .....	289
Waterford, report, .....	486
Water, chemical analysis, .....	21, 22
Water company and salt flow, .....	813
Water company, opinion on, .....	817
Water disinfected, .....	470
Water pollution, opinion on, .....	813
Water supplies, report, .....	77
Water supplies and typhoid, .....	576
Water supply, pollution (see streams), .....	90, 266, 269, 271, 808
Water supply, inspected, .....	242, 432





